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Anger and Anger Control
Among Recovering Alcoholics

by

John Douglas Matthew Williamson ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements of the degree of Doctor of Philosophy

Department of Educational Psychology

Edmonton, Alberta

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Abstract

A considerable body of evidence exists which suggests that "normal" individuals and "alcoholics" who consume alcohol may become more angry and aggressive. Possible reasons for these changes include pharmacological action, expectations, personality variables, and the situation involved, acting either alone or in combination. As an effect of intoxication, aggression has been more prominent in the research literature, perhaps because it is an observable behavior and a serious problem in society. In addition, only recently has a well-developed anger scale (STAXI; Spielberger, 1986) become available to the researcher. The purpose of this study was to test four hypotheses related to anger in a sample of "alcoholics" admitted to a detoxification centre in an intoxicated state. Subjects were administered the STAXI under three conditions before completing detoxification: upon admission while still intoxicated ("initial"), after "alcohol withdrawal" while sober but "as if" intoxicated, and after "alcohol withdrawal" while sober ("now"). For men only, the "initial" anger scores were significantly higher than the American male norms on State Anger, Anger-In, and Anger Expression. In the "as if" condition, males were significantly higher than norms on the State Anger, Anger-In, and Anger Expression scales, and significantly lower than norms on the Anger Control scale. In the same condition, females were significantly higher than American female norms on the State Anger scale. In the "now" condition, males only were significantly lower than norms on the Anger-Out scale. Additional analyses using a revised STAXI (Spielberger, 1995) found that scores on the State Anger, "Feel Like Expressing Anger", and Anger-Out scales were significantly different between the "initial" and "now" conditions. The "as if" scores were higher but not statistically different from the "initial" scores on every scale or subscale where a main effect for condition was found. They also were significantly different from the "now" scores on State Anger, the State Anger subscales, Trait Anger, and Anger Control-Out. Comparisons with previous studies were made and any implications and differences were discussed. Other issues involving possible limitations and future research in this area were also examined.

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for her patience

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Chapter I: Introduction

Traditionally, research involving alcohol abuse begins with a description of how pervasive and costly such abuse is. Alcohol is a contributing factor in a large number of suicides, fights, homicides, accidental deaths, injuries, robberies, rapes, and assaults (Martin & Bachman, 1998, 1997; Volois, Vincent, McKeown, Garrison, & Kirby, 1993). Perhaps less obvious are the everyday incidents involving altered perception, cognition, memory, emotions, and psychomotor skills that have a tremendous impact on both those who consume alcohol and those who interact with them (Naranjo & Bremner, 1993). Widespread beliefs have attributed numerous effects to alcohol, including its ability to act as a social "lubricant", a provider of courage, a stress-reducer, and a "disinhibitor" (Marjot, 1989; Steele & Southwick, 1985; Pernanen, 1976). The exact mechanisms by which alcohol alters behaviour are still not well understood and remain a subject of inquiry (Hoaken, Giancola, & Pihl, 1998).

Alcohol has consistently been linked with aggression (Bushman, 1997; Bushman & Cooper, 1990; Hull & Bond, 1986). This association has been supported by a large amount of research undertaken over the last 40 years (Ito, Miller, & Pollock, 1996; Bushman & Cooper, 1990). In addition, as appropriate inventories have become available such as the Profile of Mood States (POMS; McNair & Droppleman, 1972) and the State-Trait Anger Expression Inventory (STAXI; Spielberger, 1986), alcoholics have typically been shown to have higher levels of anger than "normal" individuals (Tivis, Parsons, & Nixon, 1998; Potter-Efron & Potter-Efron, 1991). A strong argument could be made that anger is a necessary prerequisite for almost all aggression. At least one anger inventory (the STAXI) uses statements designed to assess how much the respondent feels like performing various aggressive acts (Spielberger, 1988). Thus, a review of the available research clearly indicates that studies involving alcohol and aggression are relevant to any discussion of alcohol and anger.

Written work dealing with the effects of alcohol on behaviour can be traced at least as far back as the ancient Greeks (MacAndrew & Edgerton, 1969). The Roman philosopher Seneca (5 B.C. - 65 A.D.) stated that "drunkenness is nothing but a form of insanity deliberately assumed" (*cf.* Pagliaro & Pagliaro, 1996). Historically, such effects were thought to be a direct consequence of what would now be referred to as pharmacological processes. More recently, it has been recognized that cognitive expectations may also be significant factors in drunken comportment (George & Marlatt, 1986; MacAndrew & Edgerton, 1969). Therefore, the actual range of behaviours, and the strength of their associated emotions, vary widely among individual drinkers. Several distinct explanations for the prevalence of anger among individuals who use alcohol can be identified. These include social-cultural influences, individual expectations, unconscious psychological processes, and pharmacological mechanisms (Chermack & Giancola, 1998). The citations that follow serve as illustrations.

In their anthropologically-based treatise on the subject, MacAndrew and Edgerton (1969) conclude that "Since societies, like individuals, get the sort of drunken comportment that they allow, they deserve what they get" (p. 173). In effect, socially-sanctioned activities and beliefs are seen as the only determinants of intoxicated behaviour.

In his study of a large number of alcoholics attending Alcoholics Anonymous, Wilcox (1998) makes the following comments regarding anger:

> One way in which the typical alcoholic in this study responded to fear in life was through anger. The specific type of anger is as variable as are the types of alcoholics themselves. Many members, particularly, but not exclusively males, developed anger to an especially destructive degree. As one said, 'I acted out of anger my entire life, and when I first came to AA I thought it was my right to be angry with anyone who didn't live up to my selfish expectations.' Many expressed the relish with which they nourished their anger and said that it was all a part of feeling 'ten feet tall and bulletproof'.
>
> Meetings are full of tragic stories involving the development and use of anger as an interpersonal tool. Some said that they vented their anger on loved ones and complete and total strangers alike. When they had an object for their anger, they could displace the feelings of inadequacy and impotence that formed their deepest beliefs about themselves. Many said that they could not function without alcohol. It became the most important tool they had to maintain their denial of responsibility of anger in order to regulate the environment, and members said it led to incredible stupidity. Whether or not the anger is acted on appears to be irrelevant. As the individual began to rationally depend on anger to support the ego structure, anger was internalized and bred persistent resentments. (pp. 89-90)

This description suggests that anger in alcoholics is a deliberate conscious or unconscious attempt by the alcoholic to deal with a variety of psychological problems.

In "The Alcoholic Self", Denzin (1987) talks about the alcoholic in terms that imply the existence of something akin to a multiple personality. Here, alcoholics seemingly relinquish conscious control over their actions. Witness the following testimony given by a 47-year-old male academic psychologist:

> My wife would bring these conversations back to me in the morning. She'd report vile things I'd said, violent actions I threatened, crude sexual gestures, promises I'd made. I could remember none of it. I'd say she was making it all up just to get back at me. I hated her for it. Who does she think she is? I'd never never say things like that. I guess it's what they call a blackout. I just don't say things like that. (p. 94)

Or the explanation given by another male in his mid-forties who works for an accounting firm and who had finally run into serious problems in his work, with his wife, and with his two daughters.

> When I drink I become another person. Like a Dr. Jekyll and a Mr. Hyde (or whatever they're called). I get violent. I swear, I throw things. Last Saturday, a week ago, I threw the kitchen table at my father-in-law. I grabbed my wife (she only weighs 98 pounds) by the throat 'cause she said I was drunk when I came home. My little girls were hanging on my leg, telling me not to hurt Mommy! Christ! What's wrong with me? I'm not violent. I don't swear. I'm quiet. I always wear a smile. I'm easy going.

> Even when things are going bad I smile and say it'll work out. But I stop and have that first beer and the next thing you know I'm drunk and there till the bar closes. Then the wife's mad. Screaming at me when I come in the door. I feel guilty, mad. Mad at myself. Mad at her. Hell, I know I'm drunk. She don't have to tell me. Why'd she throw it up at me like that? I don't want to be like this any more than she wants me to be drunk. I get crazy, like last Saturday, last week. Then we don't talk. Now she's gone! Took the girls. Told me to get professional help. (p. 144)

At times, intoxicated individuals engage in seemingly bizarre, random acts of violence. An article in the Toronto Star attempts to deal with a series of such acts in an almost humorous way:

> Half-crazed with drugs and booze, Mark Charles Cowling climbed into his car and drove down Kingston Rd. at high speed, weaving through traffic and hopping from lane to lane.
>
> Near Woodbine Ave. he rammed the back of another car and forced it into a hydro pole. Soon afterwards he rear-ended another car and sent it off the road.
>
> Cowling still wasn't finished. He picked up speed again, swerved into the passing lane and smashed into the rear end of a third car, whose driver lost control.

> Then he hit a motorcycle so hard that it leaped into the air and landed on the roof of the car ahead. The driver and passenger, who was six months pregnant, were sent flying.
>
> After leaving a long trail of destruction and three people lying injured last Oct. 4, Cowling bit the policeman who arrested him. . . . (Toronto Star, May 4, 1983).

The offender reportedly appears unconcerned with the consequences of his actions, as is often the case.

On rare occasions, an individual seemingly dissociated from any semblance of rational behavior, after consuming alcohol, commits violent crimes such as rape, assault, and manslaughter. This is illustrated in a case described by Marinacci (1963):

> A 27-year-old male had been perfectly normal until the age of 23 years, when a craniocerebral injury resulted in a right temporal skull fracture and an associated period of unconsciousness. Subsequently, following the ingestion of even a minor amount of alcohol he became belligerent, confused, and destructive. On one occasion, the patient had two cocktails five minutes before he walked into a liquor store to purchase additional liquor. On being refused the sale of the liquor he went into a rage, and the salesman attempted to subdue him. The patient picked up a knife from the counter and stabbed the salesman several times. He was overcome by several bystanders before the police arrived. The salesman was dead on the arrival of the ambulance. An alcohol-activation electroencephalogram was

> requested by the public defender. The routine study . . . showed generalized instability and isolated short spikes in the right anterior temporal area (region of the skull fracture). Following alcohol-activation, profuse spikes were recorded in the right anterior temporal area with spreading to the right parietal and temporal areas . . . (pp. 246-247)[1]

The legal profession has struggled to deal with questions of motive and intent raised by crimes of this nature (Tiffany & Tiffany, 1990).

The present study is concerned with the relationship between alcohol and anger. Issues regarding the previously-mentioned explanations for this relationship will be addressed. The study is undertaken in a positivist tradition and represents basic research (i.e., research that increases knowledge but will not necessarily facilitate changes in the area under study).

This study involves the administration of an anger inventory, on three occasions, to "alcoholics" who enter a detoxification centre for treatment. The three sets of answers obtained from these volunteer subjects reflect the responses given in an intoxicated state, in a sober state, and their sober estimates of how they would respond in an intoxicated state. The three sets were completed over a period of time ranging from two to seven days, depending on the severity of individual withdrawal symptoms and, consequently, the time needed to stabilize.

---

[1] According to a neurologist (Pincus, 1980), temporal lobe epilepsy is "suspected when aberrant behavior is inappropiate, sometimes purposeless, stereotyped, and repetitive; and associated with confusion, typical automatisms (such as swallowing), typical subjective aberations (mood change, anxiety, gustatory-olfactory hallucinations, deja vu, dreamlike states, feelings of unreality, macropsia, or micropsia), impaired memory for the events of the episode, and postictal depression." (p. 304)

The literature dealing with anger and aggression has led various researchers to suggest the following:

1. That alcoholics may have higher levels of anger than "normal" individuals (Tivis, Parsons, & Nixon, 1998).
2. That expectations may influence intoxicated emotions and behaviours, including anger (MacAndrew & Edgerton, 1969).
3. That anger may decrease when intoxicated individuals sober up (Warren & Raynes, 1972).
4. That the intoxicated state may be dissociated from the sober state (Kent *et al.*, 1986).
5. That gender and age may be significant in any discussion of alcohol-related anger and aggression (Graham & Strenger, 1988; Eshbaugh, Tosi, & Hoyt, 1980).

The pupose of this study was to further clarify each of these issues.

The specific null-hypotheses that are tested are:

1. There are no differences in anger in its various forms, as measured by an anger inventory (STAXI), between intoxicated subjects and "normal" individuals.

2. There are no differences in anger in its various forms, as measured by the anger inventory, between the responses given while intoxicated and the subjects' sober estimates of their intoxicated responses.
3. There are no differences in anger in its various forms, as measured by the anger inventory, between the intoxicated and sober sets of responses.
4. There are no gender[2] or age differences in any of the above.

Many subjects who gave their intoxicated responses to the anger inventory left detoxification early. This data set was also compared with that obtained from those who completed the detoxification process to determine whether any significant differences existed. In this case, the null hypotheses was that there are no differences in anger in its various forms, as measured by the anger inventory, between subjects who left detoxification prematurely and those who completed detoxification on the "intoxicated" data sets. Since it was not feasible to obtain a fourth set of responses where subjects would, once again, respond in an intoxicated state, this is a quasi-experimental study[3].

It was initially proposed that this study should include a fourth administration of the anger inventory two months after detoxification. Difficulties were encountered when treatment facility which was to include an anger management program. New admission policies at this facility along with the limited access given to the researcher led to the abandonment of this phase of the project.

---

[2] The terms "sex" and "gender" are typically used to refer to the male/female factor. The American Psychological Association prefers "gender" in studies involving human subjects.

[3] This could have been accomplished if after sobering up, volunteer subjects were somehow reintoxicated. Alternatively, if much more time was spent at the detoxification centre by the researcher, many subjects who had completed the process would probably be readmitted.

Chapter II: Review of the Literature

Introduction

Research on alcohol and alcoholics intensified with the general boom that began in the 1950's in fields of study such as medicine, psychology, and other social sciences. Evidence of this boom can be found in the proliferation of research journals. Much of what is presently known, particularly with respect to alcohol and violence, has its roots in work done in the 1960's and 1970's. Stringent ethical requirements have made practices such as serving alcohol to research subjects or the administration of electric shocks to "victims" more difficult. Recently, advances in medicine and imaging have shifted the focus to areas such as pharmacology and neurochemistry (Nakagawa & Iwasaki, 1996; Naranjo & Bremner, 1993).

This review examines the available work on alcohol and anger. Also relevant are the abundant studies on alcohol and aggression or violence. Research on disinhibition and stress-reduction is presented in an effort to identify the mechanisms that influence intoxicated behaviour. Lastly, the measurement of anger, particularly with the STAXI (Spielberger, 1986), is summarized.

Anger

Anger is a universal emotion (Novaco, 1975). It can be viewed as a response to provocation that has well-defined autonomic (Ax, 1953), central nervous system components (Moyer, 1971; 1973), and cognitive aspects (Schacter & Siner, 1962). Anger may serve to energize behaviour, leading to hostility (antagonism) or aggression (offensive activity). Some theorists, such as Darwin (Ekman, 1973) and Freud (Hall & Lindzey, 1970), have argued that human beings are instinctively aggressive, reflecting the legacy of our animal roots. However, the number of animals that actually experience anger in ways similar to man is extremely limited (Young, 1973), perhaps revealing the importance of cognitive involvement.

Children exhibit anger virtually from the time they are born, and experience it with increasing intensity and complexity as they grow up (Plutchik, 1962). When cognitive factors are minimized (as in young children), anger appears transient in nature. For example, in a study of children aged seven years and younger, Goodenough (1931) found that virtually all angry outbursts lasted less than four minutes.

In adults, the phenomenon of anger appears to be much more complex. Individuals may be piqued or they may be enraged, they may carry a grudge or have "an attitude". Freud postulated the existence of repression and various other defence mechanisms that allow certain negative feelings to remain outside of conscious awareness (Erdelyi, 1985). The concepts of "anger-in" and "anger-out" were introduced by Funkenstein, King, and Drolette (1954) to describe the behaviour of college students who were exposed to stress-inducing laboratory situations. The "anger-in" group reported feeling annoyed with themselves and had much higher increases in pulse rate as well as other cardiovascular measures than the "anger-out" group whose members directed their anger towards the experimenter. Although everyone experiences anger, a wide range of possible reactions to it are evident.

Terms that are often associated with anger are frustration, hostility, aggression, and violence. Frustration refers to either the blocking of goal-directed behaviour or the "unpleasant state of tension, anxiety, and heightened sympathetic activity" associated with such blocking (Chaplin, 1985, p. 186). The distinctions between the other terms are summarized by Spielberger, Jacobs, Russell, and Crane (1983) as follows:

> Anger usually refers to an emotional state that consists of feelings that vary in intensity, from mild irritation or annoyance to intense fury and rage. Although hostility usually involves angry feelings, this concept has the connotation of a complex set of attitudes that motivate aggressive behaviours directed toward destroying objects or injuring other people . . . While anger and hostility refer to feelings and attitudes, the concept of aggression generally implies destructive or punitive behaviour directed towards other persons or objects. (p. 16)

Alcohol has consistently been linked with violent behaviour but questions concerning causality remain (Milner & Chilamkurti, 1991; Pernanen, 1991). Marjot (1989) states that "A connection between alcohol consumption, accidental injuries and violent accidental death has been clearly shown" (p. 288). This, he contends, may only be due to increased risk taking, inattention, and motor incoordination. Aside from this, the suicide rates for alcoholics are many times higher than those for the general population (Felts, Chenier, & Barnes, 1991) – probably due to multiple causes and associations. Alcohol is also a factor far more frequently than would be expected by mere chance in crimes such as homicide, theft, burglary, and fraud (Valois *et al.*, 1993), and is also very prominent in family violence (Flanzer, 1990). Gunn (1973) contends that anger is not necessary for violence or aggression. Blum (1981), like Marjot, drew attention to the many potential confounding factors that connect anger to alcohol and violence, including situation, cultural sanction, and group interactions. Dollard *et al.* (1939) listed anger as a word that was representative of the concepts involved in their frustration-aggression hypothesis (i.e. that aggression is always a consequence of frustration). Beck (1976) stated that anger as an emotion was distinct from violent or aggressive behaviour that was influenced by provocation and threat appraisal. Accordingly, the strength of the angry response depended on cognitive factors such as value judgments, self-esteem, and expectations, all of which were regarded as enduring dispositions.

Hostility has often been defined in a manner similar to aggression (Berkowitz, 1962; Moyer, 1976) while Buss (1961) contended that hostility was an attitude which reflected a dislike of others and a tendency to evaluate them negatively. Spielberger, Jacobs, Russell, and Crane (1983) saw hostility as "a complex set of attitudes that motivate aggressive behaviours directed toward destroying objects or injuring other people" (p. 16).

Anger serves a number of functions which may or may not be seen as positive. Novaco (1975) summarizes six possible typical functions of anger as follows:

(1) energizing behaviour as it raises the amplitude of responses.

(2) disrupting ongoing behaviour by agitation, by interference with attention and information processing, and by inducing impulsivity.

(3) expressing or communicating negative feelings to others.

(4) defending against vulnerability to ego threat by preempting anxiety and externalizing conflict.

(5) instigating or eliciting antagonism as a learned stimulus for aggression.

(6) discriminating an event as a provocation, which serves as a cue to act in ways that cope with stress. (p. 6)

Clearly, anger is intimately connected to survival in both an emotional and physical sense.

For alcoholics, Potter-Efron and Potter-Efron (1991) suggest 10 other possible psychological functions of anger which are often considerably more maladaptive. These functions are summarized below.

1. Anger may signal that something is seriously wrong in a situation.
2. Anger may be an attempted solution for problems in living.
3. Anger can become a habit that is self-reinforcing.
4. Anger can be an attempt to gain power or status over others.
5. Anger may be a way to keep others emotionally or physically distant.
6. Anger may be used to hold certain relationships together.
7. Anger may be a defence against shame.
8. Anger may be a defence against other feelings.
9. Anger may be used in the name of righteousness. Moral indignation and sanctimonious contempt are examples in which case a position of moral superiority is implied.

10. Anger may serve as a mood-altering experience which generates excitement and can become addictive in itself.

    (pp. 41-43)

It is interesting to note that all of the above may be valid for poorly adjusted non-alcoholics as well.

Personality Inventories, Anger, and Alcoholics

For many years researchers believed that it might be possible to identify alcoholics on the basis of their responses to standardized instruments such as the Minnesota Multiphasic Personality Inventory (MMPI, Hathaway & McKinley, 1951). To date, no single "alcoholic personality" has been found, but work done in this area provides some insight into the traits of various subtypes of alcoholics. A number of studies indicate that anger, in its various forms, is an integral part of the character of most subtypes.

Graham and Strenger (1988) conducted a review of MMPI research in this area and concluded "that there are at least six rather distinct alcoholic profile types" (p. 202), none of which are unique to alcoholics. After reviewing the evidence, Graham and Strenger state that "As a group, alcoholics have in common a tendency to be impulsive, to resent authority, to have low frustration tolerance, and to have poorly controlled anger" (p. 202).

Graham and Strenger generally adopted Goldstein and Linden's (1969) four subtypes and added two additional subtypes. Type I alcoholics seem to drink less and have less severe problems related to their alcoholism. Despite this, these individuals are excitable, ineffective, impulsive, dissatisfied, and often exhibit poor adjustment at work or in their marriage. Graham and Strenger conclude that the Type I alcoholic's anger "is poorly controlled: It is sometimes turned outward in the form of tantrums or assaultiveness and sometimes turned inward in the form of suicide threats or attempts." (p. 199).

Type II alcoholics are described in the following manner:

> Persons with this profile type experience a great deal of turmoil and tend to have rather schizoid life-styles. They feel tense, anxious, and nervous and have problems with concentration and attention, depression, despondency, and hopelessness are common, as is rumination about suicide. Feeling inadequate and inferior, these persons lack basic social skills and are shy, withdrawn, introverted, and socially isolated. They are perfectionistic, setting high standards for themselves and feeling guilty when the standards are not met. (p. 199)

Type II alcoholics appear to have the highest alcohol intake and greatest job instability of all. They reported the greatest anger while drinking.

Type III alcoholics were characterized as having "long histories of alcoholism interspersed with acute alcoholic episodes" (p. 199). They may go through cycles of acting out and then experiencing guilt. Individuals in this category are often impulsive, self-centred, and have a low frustration tolerance.

Graham and Strenger's Type IV alcoholics show a . . .

> Marked disregard for social standards and values and frequently get into trouble with authority. Self-centred, self-indulgent, and impulsive, they

> often show poor judgment and do not seem to anticipate the consequences of their behaviours. They make good first impressions, but relationships tend to be shallow and superficial. Having a low frustration tolerance, they frequently express anger and hostility in emotional outbursts. (p. 200)

In terms of a DSM-IV-TR (American Psychiatric Association, 2000) diagnosis, such people would be labelled as having an "Antisocial Personality Disorder".

Graham and Strenger also recognize the existence of another subtype in which personality disorders and neurotic diagnoses are found. These individuals exhibit somatic symptoms, such as gastric problems, when faced with a stressful situation.

The last subtype described by Graham and Strenger contains those whose behaviour reflects serious psychopathology, including many who are psychotic. Typically, disordered thinking, inappropriate affect, poor judgment, and problems in coping with daily life are characteristic. Other problems are summarized by Graham and Strenger:

> They were most likely among the groups studied to have lost their jobs, to have had previous psychiatric care; and to have had alcoholic fathers. . . They tended to drink at earlier ages than the other alcoholics studied. They frequently became belligerent while drinking and reported severe problems in relationships with friends but not with spouses or other relatives. Many of these alcoholics were single and lived alone . . . Those with more elevated profiles were likely to have higher than average scores on the Zung Depression Index . . . Many were polydrug abusers . . . (p. 200)

In addition, it appears that persons who fall into this subtype consume large amounts of alcohol and respond best to treatments that concentrate on teaching coping skills.

Eshbaugh, Tosi, and Hoyt (1980) implemented a similar typological study of 183 females admitted to a treatment unit for alcoholics. It was found that slightly less than half of the sample (45.4%) could be placed in the five groups that were essentially the same as those found in a previous study among men by the authors (Eshbaugh, Tosi, & Hoyt, 1978). Examination of the mean profile for female alcoholics suggests that depression and social maladjustment were the most significant symptoms, as was previously found among male alcoholics. In their comments concerning female alcoholics, the authors state that "Depression, acting out and possibly indirect expression of excessive underlying anger and hostility were prominent in the sample as a whole and in three of the five types . . ." (p. 315).

Corbisiero and Reznikoff (1991) studied Millon Clinical Multiaxial Inventory (MCMI) profiles and came up with three subtypes of alcoholics based on cluster analysis. Data obtained from 250 male inpatients who were in treatment at a Veterans' Administration Hospital suggested that subjects could be grouped according to the severity of their symptoms. Cluster one (9.7% of the sample) exhibited the smallest overall elevation of the MCMI scales which were not clinically significant. Cluster two (23.5%) had significant elevations of the Anti-social and Narcissistic Personality scales, as well as the Alcohol and Drug Abuse scales. The third cluster (66.8%) was characterized by significant high scores on the Avoidant, Passive-Aggressive, Anxiety, Dysthymic, and Alcohol Abuse scales.

Anger figured prominently in two of the three subtypes outlined by the authors. Accordingly, members of Cluster Two had personality patterns that were antisocial and narcissistic and were characterized as "exploitive, defiant, and often hostile, with an inflated self-image or sense of entitlement, with a lack of sensitivity or indifference to the rights of others" (p. 296). Even more explicit is the role anger may play in those in Cluster Three, whose

> . . . basic personality pattern is highlighted by avoidant and passive-aggressive features and have difficulty in managing and expressing emotions. As such, they feel uncomfortable, frustrated, and dysphoric much of the time. (p. 295)

In a discussion of the results of this study, Corbisiero and Reznikoff also point to the need for different treatments for different subtypes.

Research on Anger and Alcohol

The connection between anger and alcohol has not been as prominent in the research literature as has the connection between alcohol and aggression or violence. The number of studies dealing with aggression easily outnumbers those dealing with anger by a factor of ten. As a consequence, many older studies dealing with anger are included and summarized in the present review.

Warren and Raynes (1972) examined mood changes among various conditions of alcohol intake. Subjects consisted of six male and six female college students who participated in each experimental condition. The experimental conditions were intravenous saline, intravenous alcohol, social drinking, and isolated drinking. Blood alcohol concentration (BAC) was measured using a Breathalyzer and mood was assessed with the Profile of Mood States (POMS: (McNair & Droppleman, 1972).

Details of the exact procedures used in the study are as follows:

> The study took place over a period of 8 days. Two groups of subjects came each day, one receiving an IV condition (alcohol or saline) and the other a drinking condition (social or isolated). There were 1 or 2 days between treatments.
>
> When the subjects arrived at approximately 9 AM they were directed to a large lounge where they were given coffee (they were requested not to eat before arriving) and permitted to socialize for about 15 minutes. During this time, initial vital signs were taken and the POMS was first administered. They were then assigned to their scheduled experimental conditions: subjects in the isolated-drinking condition were in small private rooms equipped with desk and chair; in the social-drinking condition, in a large room provided with couches, chairs, tables and a TV; and in the IV conditions in small bedrooms. The students were permitted to bring in any reading material, games, cards, etc. that they wanted. In the social drinking condition, however, they were encouraged to interact rather than isolate themselves with reading material.
>
> In both the social and isolated drinking, large bottles of bourbon whisky and several mixes were available and subjects were encouraged to

> drink as much as they could. In the IV alcohol condition, a 15% solution of ethanol in saline was infused at the rate of 8 ml per min.
>
> Blood alcohol concentration (BAC) was measured regularly during the course of the study using a Breathalyzer. When the BAC approximated 0.05%, the POMS was given for the second time. (Breathalyzer readings were also taken from the IV saline group to minimize the possibility of the subjects' knowing what they were receiving.) Subjects were then requested to continue drinking, or injections continued, until the BACs reached approximately 0.10% at which time they were given the POMS for the third time and the session terminated. The experimental sessions lasted between 3 and 4 hr; the subjects remained at the hospital until the BACs fell below 0.05%.

Results indicate that for a BAC of 0.05%, the following significant decreases were found: on Tension-Anxiety for all three alcohol conditions ($p < .01$), on Friendliness for social drinking ($p < .01$), and on Vigor-Activity in IV alcohol for isolated drinking ($p < .01$). Significant increases occurred for all three alcohol conditions on Depression ($p < .01$ for oral groups and $< .05$ for IV), Fatigue ($p < .01$), and Confusion ($p < .01$). Significant increases were also found in the IV-saline group on Friendliness ($p < .01$) and the oral alcohol groups on Anger-Hostility ($p < .01$).

For a BAC of 0.10%, most of the above results became more pronounced, with all of the alcohol groups showing significant mood differences at a significance level of .01 on all scales except Anger-Hostility and Friendliness. Anger-Hostility remained significant at the .05 level, overall, for the combined alcohol groups while only the oral group became significantly less friendly (*p* < .01). For the IV-saline group, Anger-Hostility, Depression, and Fatigue-Inertia decreased significantly (*p* < .01) while Friendliness (*p* < .01) and Vigor-Activity (*p* < .05) increased significantly (Warren & Raynes, 1972).

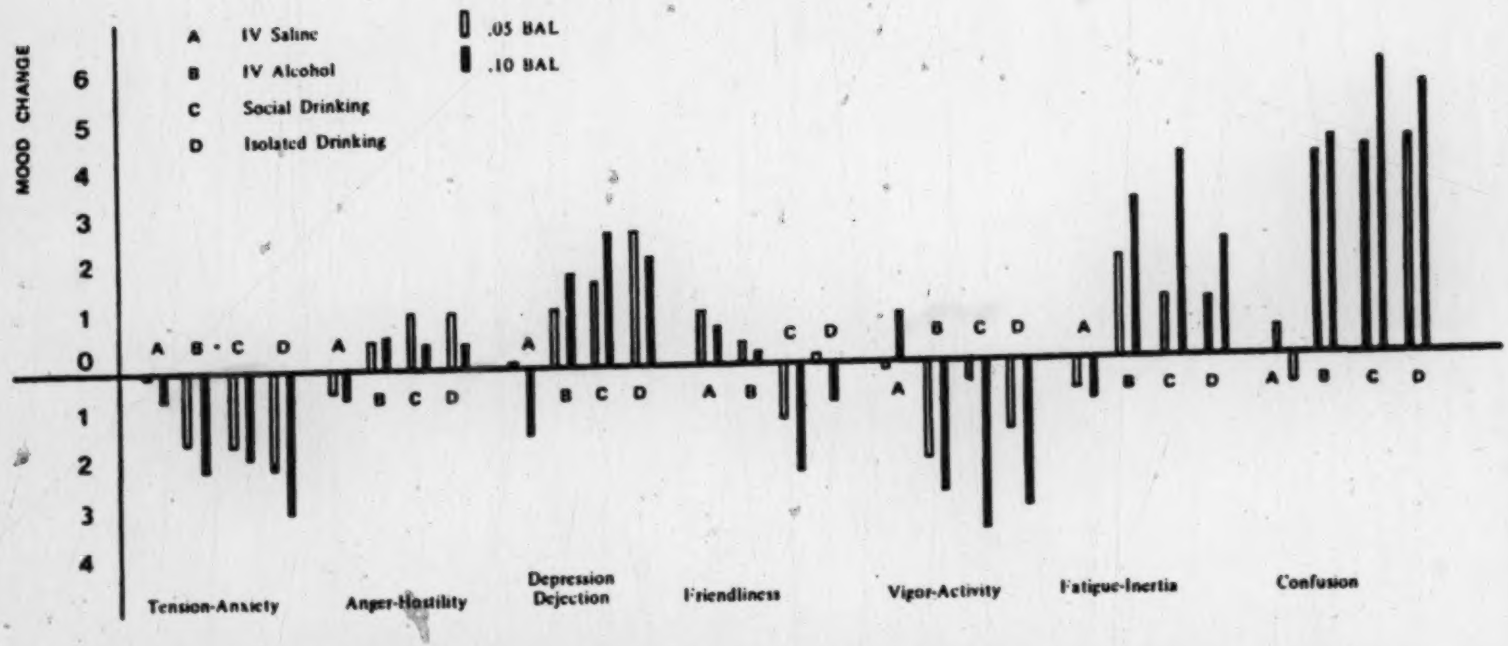
A further analysis was carried out to determine if treatment conditions showed significant differences in mood changes. While a significant effect was found on both Fatigue-Inertia and Confusion, this effect was evident only between the three alcohol conditions and the saline condition. No significant differences among the three alcohol conditions were found. Figure 1 summarizes the results of this study.

In their study of anger and alcohol consumption, Marlatt, Kosturn, and Lang (1975) manipulated a contrived situation in a research laboratory. The abstract from their article summarizes the procedure as follows:

> The subjects, consisting of an equal number of male and female college students identified as heavy social drinkers (*n* = 60), were randomly assigned to one of six groups in a 3 x 2 factorial design. In addition to the subject sex factor, the three main treatment groups were (a) provocation to anger with no opportunity to retaliate, (b) provocation to anger with opportunity for retaliation, and (c) a no provocation, no retaliation control group. Provoked subjects were angered by an insulting confederate, whereas control subjects experienced a neutral interaction with the confederate. In the retaliation condition, subjects were given the opportunity to deliver a fixed number of shocks to the confederate who had

Figure 1

Mean Mood Changes on All POMS Factors
at BACs of 0.05 and 0.10%
(Warren & Raynes, 1972)



Note. From "Mood changes during three conditions of alcohol intake", by G. S. Warren and A. E. Raynes, 1972, Quarterly Journal of Studies on Alcoholism (presently Journal of Studies on Alcoholism), 33, p. . Copyright 1972 by Journal of Studies on Alcohol, Inc., Rutgers Center of Alcohol Studies, Reprinted with permission.

> provoked them. Drinking rates in all subjects were then determined by their participation in a standardized taste-rating task, which permitted an unobtrusive measure of alcohol consumption. (p. 652)

Results indicated that provoked subjects who were allowed to express their anger (retaliate) consumed significantly less alcohol ($p < .01$) than those who were not. Control subjects drank amounts of alcohol that were, on the average, somewhere between the amounts observed for the other two groups. Gender of subject was not a significant factor.

In a study designed to gauge alcohol's effects on memory for feelings, Cowan (1983) gave either alcohol or a placebo on two separate occasions 48 hours apart to 32 subjects divided equally into four groups (Placebo-Placebo, Placebo-Alcohol, Alcohol-Placebo, and Alcohol-Alcohol). The POMS (McNair & Droppleman, 1972) was used a total of five times to assess the subject's feelings using the following procedure:

> Current feelings were measured just before each subject drank his alcohol or placebo in each session (test 1 in session 1; test 3 in session 2). At 105 minutes after the completion of drinking in each session, a second measure of current feelings was obtained (test 2 in session 1; test 4 in session 2). This subject was directed to fill out each of these measures with reference to his feelings during the previous half hour. The final POMS (test 5; memory testing) was administered immediately after the completion of test 4 in the second session. The subject was asked to describe "how you felt during the last session at this time," *i.e.*, to

> reproduce the affect ratings that were recorded on test 2 (learning). The subjects were not forewarned that their memory for their feelings would be tested; all learning was therefore incidental. (Cowan, 1983, pp. 41-42)

Memory bias was determined by subtracting the results of the second set of results from the fifth set of results on each of the six POMS scales. Subjects who were given alcohol in the first session (in both the Alcohol-Placebo and the Alcohol-Alcohol conditions) subsequently exhibited significant ($p < .01$) bias on the Anger-Hostility Scale. Simply put, these subjects "remembered themselves as being more angry than they originally stated" (Cowan, 1983, p. 43).

Walfish, Massey, and Krone (1990) assessed levels of anxiety and anger among abusers of different substances using the State Trait Personality Inventory (Spielberger, 1979). Participants included 809 adults being treated for either alcohol, cannabis, cocaine, or opiate abuse for 30 days (38 days for cocaine) in a Rehabilitation Unit. The results suggest three conclusions regarding those who abused these substances. First, when trait anger scores obtained in this study were compared to the general population norm, the means for the four groups would have fallen between the 82nd to 86th percentile – suggesting that anger may be a common problem among substance abusers. This point was supported by the authors' second finding that there were no statistically significant differences in anger between the various groups. Third, Walfish, *et al.* reported that "no sex differences were found on trait anger levels based on drug of choice" (p. 254).

Potter-Efron and Potter-Efron (1991) administered the State-Trait Anger Expression Inventory or STAXI (Spielberger, 1988) to 141 alcoholics and adult children of alcoholics to assess a number of aspects of anger. These included state anger, trait anger, the ready expression of anger, sensitivity to criticism, anger directed inward, anger directed outward, overall anger, and anger control. The STAXI is probably the most highly developed instrument available for the purpose of anger assessment. It should be noted that all of the subjects were being treated in either an inpatient or outpatient setting.

The data from this study was analysed using a two-way analysis of variance. The results indicate clearly . . .

> . . . that the study of anger is relevant to a population affected by alcoholism. Males are particularly more angry in terms of State Anger (immediate angry responses to a situation). They appear to be less affected by criticism and evaluation than men in the general population. Although their general Trait Anger scores are average, specific components are quite high: T Ang T [the ready expression of anger], Anger In, Anger Out, and Anger Exp [the intensity of anger feelings]. Females register less State Anger but more Trait Anger. Like the males, they score significantly above national norms on T Ang T, Anger In, and Anger Out. (p. 38)

In a discussion of anger in alcoholic treatment, Potter-Efron and Potter-Efron note that a dual-denial system may be in effect. Apart from the obvious concern with the denial of alcohol problems, there also arises issues surrounding the denial of anger (p. 44).

Potter-Efron and Potter-Efron present the results of their study in a manner that makes comparisons difficult. Instead of providing the actual means and standard deviations obtained by their subjects on the various STAXI scales and subscales, they have chosen to merely indicate whether these means are significantly above or below national norms and at what level of significance. These figures are reproduced in Table 1.

Table 1

Differences Between Tested Male and Female Adults
From Populations Affected by Alcoholism
and National Norms (Potter-Efron & Potter-Efron, 1991)

TYPE OF ANGER	MALES	FEMALES
State Anger	+ (.05)	
Trait Anger		+ (.05)
T Anger T	+ (.05)	+ (.05)
T Anger R	- (.05)	
Anger In	+ (.05)	+ (.05)
Anger Out	+ (.05)	+ (.05)
Anger Control	- (.01)	---
Anger Expression	+ (.01)	—

"+" indicates scores above national norms; "-" = below national norms.

Note. From "Anger as a treatment concern with alcoholics and affected family members", by P. S. Potter-Efron and R. T. Potter-Efron, 1991, Alcoholism Treatment Quarterly, 8, p.39. Copyright 1991 by Haworth Press, Inc. Reprinted with permission.

In a paper entitled "Interactional Group Therapy with Alcoholics", Brown and Yalom (1977) discuss the importance of dealing with anger when treating alcoholics. They note that "the vast majority" of alcoholics cannot express anger directly and that "drinking [facilitates] the expression of anger" (p. 451). The authors go on to describe the various ways in which the alcoholic's anger can manifest itself:

> Some patients, as we have noted, went through a regular cycle in which there was a gradual increase in tension followed by drinking, then by an explosive outburst of rage. Massive guilt and remorse (only partly alleviated by displacing responsibility to the alcohol) ended the cycle which started again immediately. Other patients dealt with their anger through silence, denial or isolation from all feelings. Still others used a passive-aggressive expressive mode. As a passive-aggressive weapon, alcohol works well: members can deny that they have an angry intent, but their drinking, nevertheless, leads repeatedly to unfortunate repercussions for others in their life. Of course, too, the passive-aggressive mode is highly destructive: in an effort to punish others, members destroy themselves either through alcohol or through a mobilization of their energy for destructive purposes. One patient, for example, was so angry at the therapists (primarily for failing to meet unrealistic demands) that she sabotaged her own therapy and her own growth in an effort to defeat the therapists. She said in effect, "my failure in therapy is proof of your incompetence".
>
> Other patients were so overwhelmed by anger and guilt that they were virtually paralysed. One member came to the group in a panic over a decision to attend an encounter-group-marathon weekend. A friend of hers

> had attended the encounter group previously and had become a zealous convert. She urged the patient to sign up. In fact, the patient felt that her friend placed so much importance on it that their friendship would be jeopardized if she did not comply. Furthermore, a part of her wanted to attend, yet she was overwhelmed with guilt. Analysis of the situation revealed that the patient was, in effect saying "I am angry and disappointed with the group and I am going elsewhere to get what I am not getting here". At the same time, she was enraged at the friend for making her friendship contingent on her attendance. She could not express, nor at first even experience, any of this anger and instead was overwhelmed with the free-floating guilt and fear which issued from imagined repercussions (guilt from hurting others and fear from the retaliation of others). (pp. 451-452)

Tivis, Parsons, and Nixon (1998) administered the State Anger, Trait Anger, Anger-In and Anger-Out scales of Spielberger's (1988) STAXI to 104 alcoholics (sober 21 to 45 days) being treated in an inpatient facility. In order to facilitate comparisons, 70 community controls were also asked to respond to the STAXI items. Inventories assessing depression and anxiety were used in the study as well. The results, which appear in Table 2 indicate that male alcoholics score significantly higher than controls on Trait Anger, Anger-In, and Anger-Out, while female alcoholics score significantly higher than controls only on Anger-In.

Table 2 Mean (SD) Anger Scale Scores (Tivis, Parsons, & Nixon, 1998)

	Alcoholics		Controls	
	Males	**Females**	**Males**	**Females**
S-Anger	10.84 ± 2.20^{A}	10.32 ± 1.25^{A}	10.12 ± 0.48^{A}	10.27 ± 0.80^{A}
Range	10.00-22.00	10.00-17.00	10.00-12.00	10.00-14.00
T-Anger	19.26 ± 4.83^{A}	17.85 ± 4.20^{AB}	14.70 ± 4.07^{C}	16.15 ± 4.18^{BC}
Range	10.00-36.00	12.00-29.00	10.00-29.00	12.00-29.00
AX/In	18.38 ± 4.60^{A}	17.91 ± 5.35^{A}	12.70 ± 3.54^{B}	13.00 ± 3.14^{B}
Range	9.00-29.00	10.00-28.00	8.00-24.00	8.00-20.00
AX/Out	15.57 ± 3.89^{A}	15.45 ± 3.42^{A}	13.11 ± 3.90^{B}	14.61 ± 4.53^{AB}
Range	9.00-27.00	9.00-24.00	8.00-23.00	8.00-25.00

Means that share superscripts are not significantly different ($p > 0.05$).

Note. From "Anger in an inpatient sample of chronic alcoholics", by L. J. Tivis, O. A. Parsons, and S. J. Nixon, 1998, Alcoholism: Clinical and Experimental Research, 22, p.905. Copyright 1998 by Lippincott, Williams and Wilkins. Reprinted with permission.

Alcohol and Aggression

In their extensively-researched book entitled *Drunken Comportment*, published in 1969, MacAndrew and Edgerton present an explanation for the changes found in the intoxicated state based on social psychology. They state at great length, using many examples to back up their claims, that:

> Rather than viewing drunken comportment as a function of toxically disinhibited brains operating on impulse-driven bodies, we have recommended that what is fundamentally at issue are the learned relations that exist among men living together in a society. More specifically, we have contended that the way people comport themselves when they are drunk is determined not by alcohol's toxic assault upon the seat of moral judgement, conscience, or the like, but by what their society makes of and imparts to them concerning the state of drunkenness. (p. 165)

Their examples are, as a rule, drawn from historical accounts of various groups of natives in North and South America who have usually had only limited contact with mainstream society. They argue against the prevalent beliefs that "alcohol depresses the activity of the 'higher centers of the brain'" (p. 13) resulting in a loss of both reason and conscience.

To illustrate their emphasis on the exceptions to these beliefs they reproduce a description of the Camba, a group found in Eastern Bolivia, who engage in a continuous cycle of alcohol consumption during a fiesta:

> Among the Camba drinking does not lead to expressions of aggression in verbal or physical form . . . Neither is there a heightening of sexual activity: obscene joking and sexual overtures are rarely associated with drinking. Even when drunk, the Camba are not given to maudlin sentimentality, clowning, boasting or 'baring souls'. (Heath, 1958, p. 501 *cf.* MacAndrew and Edgerton).

Evidently, the Camba do not exhibit what many would call the "disinhibition" that seemingly accompanies intoxication.

MacAndrew and Edgerton argue that drunkenness may be nothing more than a culturally-sanctioned "time out". Drunken comportment, accordingly, is merely a reflection of what a particular society will permit.

Steele and Southwick (1985) examined the effects of alcohol on social behaviours including aggression, self-disclosure, and sexual "adventuresomeness". Steele and Southwick use a cognitive impairment model to explain changes in behaviour and adopt many of the accepted consequences of alcohol consumption on perceptual and cognitive functioning. These include abstraction and conceptualization (Kastl, 1969; Tarter, Jones, Simpson, & Vega, 1971), the elaboration needed to encode meaning (Birnbaum, Johnson, Hartley, & Taylor, 1980), the encoding of multiple situational cues (Washburne, 1956), the handling of multiple cues simultaneously (Medina, 1970; Moskowitz & DePry, 1968), and strategies employing active or systemic encoding (Rosen & Lee, 1976). Building on the work of others in this area (Pernanen, 1976; Zeichner & Pihl, 1979, 1980; Hull & Young, 1983), Steele and Southwick state that:

> . . . according to these models, alcohol's impairment of perceptual and cognitive functioning – in particular, its narrowing of perception to more immediate cues and its weakening of abstracting and conceptual ability – allows the instigation of social responses but impairs their inhibition, an effect that can make social responses more extreme. In making this summary, we are aware that alcohol affects response instigation as well as inhibition. Its damage to perception and cognition means that during intoxication responses will be instigated by fewer, more immediate cues (external cues and internal cues arising from drive states, response disposition, etc.) and by less subtle meanings of those cues. Still, these deficits do not prevent response instigation, they simply restrict the cues that can initiate it.
>
> In contrast, alcohol should generally weaken response inhibition. Once a response is instigated, its inhibition requires further information processing: negative consequences of the response must be conceptualized,

> standards of conduct must be accessed and evaluated in relation to the response, and potentially inhibiting cues perceived and their inhibitory significance understood. Alcohol's damage to perception, however, makes it harder for one to notice peripheral inhibiting cues. For cues that are noticed, its damage to cognition makes it harder for one to grasp their inhibitory meaning. (p. 19)

Furthermore, Steele and Southwick state that an extreme social behaviour is more likely when that particular behaviour is under high inhibitory response conflict.

To test their theory, Steele and Southwick performed a meta-analysis on 34 studies and concluded that "the average drunken subject was socially more extreme than 70% of his or her sober cohorts" (p. 23). Results also indicate that behaviours under high inhibitory conflict were significantly influenced by alcohol, and more so at higher blood alcohol levels. Expectancy effects were found to be significant as well, but were statistically independent of conflict. In their discussion, the authors note that alcohol's effects on behaviour are mediated by several factors and are not merely the consequence of direct pharmacological action.

Hull and Bond (1986) also used meta-analysis techniques to investigate the effects of alcohol consumption and expectancy (the belief that alcohol has been consumed). Aggression was one of a number of social behaviours examined, and, after reviewing seven relevant studies, it was found that expectancy does not increase aggression. Similarly, Hull and Bond concluded that consumption has "a near significant effect of increasing aggression" (p. 354). The authors noted that the results from the studies used for the meta-analysis were not heterogeneous.

Additional findings suggested that the main effects of expectancy were increased alcohol consumption and increased sexual arousal in response to erotic stimuli. Actual consumption resulted in impairments of information processing and motor performance, and improvement in mood.

Another meta-analysis of 30 studies on alcohol and aggression was carried out by Bushman and Cooper in 1990. A primary concern of this analysis was the evaluation of four possible explanations for intoxicated aggression, which were initially outlined by Graham (1980) and are summarized below.

1. Direct Cause: alcohol may cause aggression by essentially anesthetizing the areas in the brain that would normally inhibit such action.
2. Indirect Cause: alcohol may facilitate aggression indirectly as a result of various cognitive, physiological, and emotional changes.
3. Motive for Drinking: the motives that lead to drinking may interact with alcohol to increase aggressive behaviour. Two motives that may be involved are anxiety reduction (Horton, 1943) and the desire for increased power (McClelland, Davis, Kalin, & Wanner, 1972).
4. Predispositional-Situational Factors: people who drink are either predisposed to behave in an aggressive manner and use their drinking as an outlet, have expectations that alcohol consumption will increase

aggression, or find that their drinking occurs in an environment that is provocative in nature.

Bushman and Cooper note that the four explanations are not necessarily mutually exclusive or independent. The studies used in the Bushman and Cooper meta-analysis typically involve the administration of either alcohol or a placebo during a teacher-learner task where the subject is always the "teacher" and is allowed to punish the incorrect responses of the learner with an electric shock. The intensity of the electric shock serves as a measure of aggression.

Taking care to group studies using either placebos, antiplacebos, or controls together, Bushman and Cooper state that:

> . . . evidence from the main meta-analysis indicates that alcohol does indeed cause aggressive behaviour. The average effect sizes for both alcohol *vs.* control, d(+) = 0.25, and alcohol *vs.* placebo d(+) = 0.61, comparisons were significantly greater than zero. (p. 348)

The authors also conclude that the results of specific group comparisons have implications for some of Graham's (1980) explanations for alcohol-related aggression. Since no significant effect was found between the antiplacebo and control groups, it appears that alcohol does not directly affect aggression. Similarly, only a small, non-significant effect was evident for the placebo *vs.* control group comparisons, which suggests that purely psychological causes based on expectancies also appear unlikely. Bushman and Cooper favour an explanation based on classical or Pavlovian conditioning that can seemingly account for all of their results. Unconditional stimuli, based on alcohol's pharmacological effects, and conditional stimuli, which arise in the environment, are both taken into account.

Alcohol and Rape

Rape can be classified as a special case of alcohol-related aggression. Several studies have attempted to estimate the involvement of alcohol in rapes that have occurred in a particular location over time. Johnson, Gibson, and Linden (1978) did this for Winnipeg, Manitoba, between the years 1966 and 1975. For 217 cases examined, it was found that alcohol was present in the perpetrator, victim or both in 72.4% of the cases. Similar studies for Philadelphia, Pennsylvania by Amin (1971) and Toronto, Ontario by Clark and Lewis (1977) yielded figures of 33.6% and 42%, respectively.

In the Winnipeg study, it was found that alcohol was a factor in 83% of "spontaneous" rapes but only 55% of "planned" rapes, the difference being attributed to situational factors. A recent national study in the U.S. by Martin and Bachman (1998) concludes that drinking by the perpetrator reduces the probability that the rape will be completed and increases the likelihood that the victim will be injured.

Altered States and Aggressive Behaviour - The Cognitive Link

Recent research has sought to identify the specific mechanisms by which alcohol alters behaviour. Alcohol acts as a CNS depressant, slowing respiration after an initial rise at low blood levels. In addition, alcohol affects circulation, the heart rate, dilates blood vessels in the skin producing a warm flush, lowers body temperature, and produces a mild diuretic effect (Julien, 1995).

A number of research studies suggest that specific alcohol-induced effects exist involving learning, cognition, and memory. In their meta-analysis, Maylor and Rabbitt (1993) found that alcohol appears to have "general linear effect on information processing" (p. 301) which leads to an increase in reaction times and an overall deterioration in recognition and recall memory. In a study of task learning and performance, Higgins, Rush *et al.* (1992) found that alcohol increased the number of errors and decreased response rates in task acquisition. In other studies, such as that by Roache, Cherek, *et al.* (1993) indicate that psychomotor impairment and mood changes are significant factors as well. Nakagawa and Iwasaki (1996) claim to have isolated the particular receptors in the brain that are responsible for alcohol-induced state-dependent learning.

Older studies reveal a wide-range of cognitive impairments that result from intoxication. Alcohol consumption narrows attention (Huntley, 1973; Moskowitz & DePry, 1968), interferes with memory (Birnbaum, Johnson, Hartley, & Taylor, 1980; Birnbaum & Parker, 1977; Craik, 1977; Jones & Jones, 1977; Rosen & Lee, 1976), and interferes with the ability to engage in abstract thinking (Tartar, Jones, Simpson, & Vega, 1971).

This multitude of cognitive effects has led to a number of cognitive theories of alcohol-induced aggression. These have been referred to as attentional hypotheses (Gustafson, 1993) and cognitive theoretical perspectives (Taylor & Chermack, 1993). One such theory was introduced by Pernanen (1976) who believed that alcohol decreased the number of cues that an individual could attend to and, as a result, tended to make the actions of others seem more arbitrary and provocative. Similarly, Taylor and Chermack (1993) suggested that intoxication forced the individual to attend to only the most salient and dominant cues. Research conducted by Zeichner and Pihl (1979) led them to conclude that intoxication reduces the ability to correctly perceive the negative consequences of one's actions.

In an attempt to clarify exactly when and how alcohol leads to aggression, Ito, Miller, and Pollock (1996) conducted a meta-analysis of alcohol-aggression studies in order to investigate the role of a number of possible mechanisms. They refer to the following "moderator variables":

1. Anxiolysis - anxiety has been defined as a warning signal that one may experience aversive consequences if a particular behaviour is engaged in (Spielberger, 1972). Situations that may provoke anger or aggression may often require that anxiety be overcome. Sayette (1993) has argued that alcohol may reduce anxiety by interfering with an individual's ability to view a situation as anxiety-provoking.
2. Inhibition Conflict (Steele & Josephs, 1990) - when a possible behaviour is "inhibited" by a set of strong cues and alcohol is consumed, the range of cues that an individual can respond to is narrowed and the inhibited behaviour is more likely to occur. In effect, only the most salient behavioural cues are responded to.
3. Provocation - Gustafson (1993) suggested that the consumption of alcohol only increases aggression when an individual is provoked.

4. Frustration - a large body of literature contends that frustration produces aggression. Consequently, it is similar to provocation.

5. Self-Focused Attention - studies by Bailey *et al.* (1983) and Ross and Pihl (1988) suggest that self-focused attention can decrease aggressive behaviour in individuals who have consumed alcohol.

In their meta-analysis, Ito *et al.* identified a total of 49 studies involving alcohol and aggressive behaviour. Judges' ratings were used to identify and assign values to the moderator variables for each study based on working definitions. Effect sizes were calculated between experimental and control groups and for high and low doses of alcohol. The authors used regression analyses on variables that were continuously distributed. For all other variables, a categorical analysis was performed. The results provide some measure of support for theories dealing with both anxiolysis and inhibition conflict, with the largest effects being achieved with higher doses of alcohol. With regards to provocation and frustration, differences were found in the direction that each variable had on effect size, contrary to predictions. Provocation actually leads to a reduction in the difference in aggression between intoxicated and sober individuals. As predicted, self-focused attention causes intoxicated individuals to behave more like their sober counterparts. In addition to their examination of moderator variables, Ito *et al.* found an overall "moderate" significant effect size for the influence of alcohol on aggressive behaviour. The calculated value was 0.54.

Hoaken, Giancola, and Pihl (1998) suggest that alcohol disrupts executive cognitive functioning (ECF). Attention, planning, organization, sequencing, abstract reasoning, self-monitoring, and the use of feedback to modulate behaviour are involved in ECF. A large body of literature has linked ECF/prefrontal cortical functioning with aggressive behaviour (see Giancola, 1995). A study by Giancola and Zeichner (1997) has found that aggression is significantly greater on the ascending limb of the Blood Alcohol Concentration (BAC) curve than on the descending limb. It would seem that subjects on the descending limb were no more aggressive than those in control groups who had not consumed alcohol.

Philippot *et al* (1999) conducted research designed to evaluate the decoding of emotional facial expressions by alcoholics. Twenty-five alcoholics at the end of a three-week detoxification process were compared to 25 controls who had been matched for age, sex, and education. Subjects in both groups were presented with a group of standardized facial expressions on a computer. The results indicate that alcoholics overestimated the intensity of facial expressions when compared to controls. This is especially pronounced in the areas of anger and contempt. In addition, alcoholic subjects reported no more difficulty than controls in the assessment of emotional facial expressions, which suggests that they are unaware of the existing deficit. These findings may have implications for theories of alcoholic aggression and violence that focus on cognitive deficits, escalation, and conflict (see Pernanen, 1976).

Alcohol and Violence

Although the relationship between anger and violence remains vague, in many instances it would seem that the two are connected. Long ago, it became evident that alcohol was a factor in numerous accidents, suicides, and major crimes such as homicide, manslaughter, assault, rape, and robbery (Naranjo & Bremner, 1993). Alcohol may also play a role in both child and spouse abuse (Leonard, 1993). It appears that statistics are available to substantiate these claims (Pan, Neidig, & O'Leary, 1994; Naranjo & Bremner, 1993). With regard to homicides, studies indicate that many individuals involved in homicides, either as offenders or victims, are intoxicated at the time of the crime. Similarly, much research has shown that alcohol is also a factor in numerous assaults. A summary of such studies appears in Table 3. Estimates of the involvement of alcohol in cases of child molestation are between 20 and 30 percent (Naranjo & Bremner, 1993; McCaghy, 1968; Nau, 1967).

Kai Pernanen has, perhaps, done more work in the area of alcohol and violence than any other researcher (Pernanen, 1991; 1976). Pernanen conducted an extensive study in 28 taverns and bars in Thunder Bay, Ontario in order to gain insight into the nature of any existing relationship (Pernanen, 1991). His data allowed him to draw certain conclusions about the ratios of the risks of various acts engaged in by males aged 30 years or over. These ratios give the probability that someone who has been drinking will engage in a particular act, compared to someone who is sober. The ratios appear in Table 4. It is interesting to note that while most acts of violence are more likely when the assailant is intoxicated, the use of weapons or objects to assault victims actually decreases. This may be related to the fact that weapons are often used at a greater distance and often require more planning than simple interpersonal assault.

For many years, Pernanen has analysed the competing explanations for the apparent increase in violent behaviour that occurs with the consumption of alcohol. In his

Table 3

Drinking by Offenders and Victims Prior to Assaults and Homicides, As Found in Studies Based on Police Reports and Court Records of Violent Crime and on Autopsies of Homicide Victims (Pernanen, 1991)

Author(s)	Location	Source of Data	Offenders		Victims	
			Sample *n*	% With Alcohol Present	Sample *n*	% With Alcohol Present
		Assaults				
Pittman & Handy (1964)	St. Louis, USA	Police reports	237	24%	241	25%
President's Commission on Crime in the District of Columbia (1966)	Washington DC, USA	Police reports	121	35%	131	46%
Aho (1976)	Finland	Police reports	527	72%	527	45%
Wasikhongo (1976)	Mombasa, Kenya	Police reports	268	58%	251	58%
Wikström (1980)	Gävle, Sweden	Police reports	808	75%	754	54%
		Homicides				
Wolfgang (1958)	Philadelphia, USA	Police reports Autopsies	621	55%	588	53%
Criminal Justice Commission	Baltimore, USA	Police reports	624	36%	578	47%
Verkko (1951)	Vyborg County, Finland	Court records	543	55%	543	48%
Virkkunen (1974)	Helsinki, Finland	Police reports Autopsies	114	66%	116	68%
Somander (1979)	Sweden	Court records Autopsies	99	70%	103	47%

(Pernanen, 1991, p. 26)

Note. From Alcohol in Human Violence (p.26), by K. Pernanen, 1991, New York, NY: Guilford. Copyright 1991 by the Guilford Press. Reprinted with permission.

Table 4 Ratio of Risk That a Violent Act Would Be Carried Out by a Drinking Male Assailant to the Risk That It Would Be Carried Out by a Sober Male Assailant in the Same Type of Situation (All Victims Aged 30 and Over) (Pernanen, 1991)

	Slapping	Pushing, or Shoving	Punching	Kicking	Hitting Grabbing, with Weapon or Object
Male victim who did not know the assailant well	1.18	1.14	1.15	2.24	0.39
Female victim who did not know the assailant well	1.08	1.26	0.78	2.96	0.89
Male victim who knew the assailant well	1.19	2.43	1.26	1.09	0.34

Note. From Alcohol in Human Violence (p.163), by K. Pernanen, 1991, New York, NY: Guilford. Copyright 1991 by the Guilford Press. Reprinted with permission.

early work (1976) he distinguishes between a direct cause model and a conjunctive, conditional, interactive, common cause model. In the direct cause model, the pharmacological effects of alcohol produce the same changes in the brain in all situations with all individuals and lead directly to an increase in violent behaviour. Pernanen states that the conjunctive, conditional, interactive, and common cause model explains . . .

> . . . the statistical association by introducing a third variable that varies independently of the other two, and that is not necessarily present in all drinking situations. Thus it allows for the possibility that not all relevant alcohol use increases aggressive tendencies. The association is explained by showing it exists [*in one or more subsets*] of alcohol use situations . . . (Pernanen, 1976, p. 384).

A particular example of Pernanen's second general class of theory, which involves an intervening variable, attempts to explain the "escalation" of aggression when alcohol is

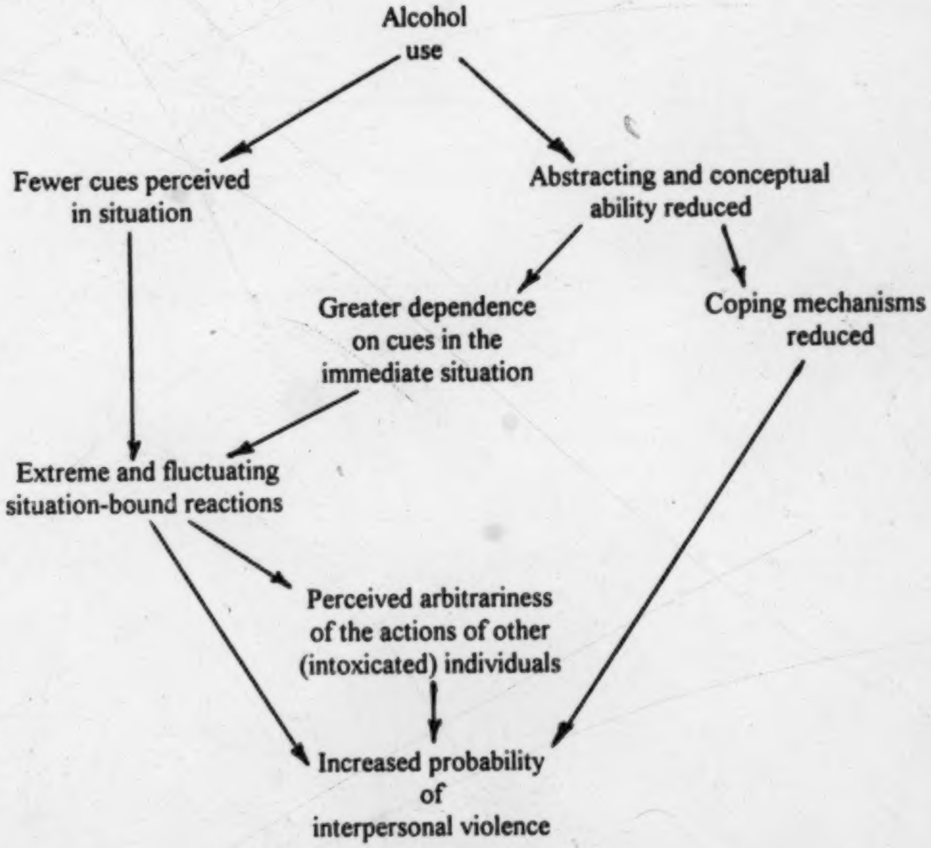

Alcohol use
Fewer cues perceived in situation
Abstracting and conceptual ability reduced
Greater dependence on cues in the immediate situation
Coping mechanisms reduced
Extreme and fluctuating situation-bound reactions
Perceived arbitrariness of the actions of other (intoxicated) individuals
Increased probability of interpersonal violence

FIGURE 2. Factors in the Use of Alcohol Leading to an Increased Probability of Interpersonal Violence (Pernanen, 1976)

Note. From "Alcohol and crimes of violence" by K. Pernanen, In B. Kissin and H. Begleiter (Eds.) The biology of alcoholism: Vol. 4. Social aspects of alcoholism, (p.416), 1976, Copyright 1976 by Plenum Publishing. Reprinted with permission.

consumed in certain situations due to the narrowing of the perceptual field (Pernanen, 1976). Figure 2 illustrates the possible factors involved in this scenario. In this case, Pernanen refers to the intervening variable as the "paresthesia induced by alcohol" (1976, p. 416).

In an attempt to explain all of the links between alcohol and violent behaviour, Pernanen offered the following eight reasons why those who consume alcohol may exhibit more violent behaviour than the rest of the population:

1. Alcoholics may have a greater risk of being apprehended by the police, both because of a greater risk of acute alcohol effects at any time and because of their status as alcoholics and recidivists, which generally makes them better known to the police than nonalcoholics.
2. Due to the higher risk of acute use of alcohol at any time, alcoholics are at a higher risk of displaying violent behaviour, whatever the appropriate causal models of a situational nature.
3. Prolonged excessive alcohol use may be connected with predispositional attributes that increase the probability of aggressive behaviour in connection with acute alcohol use. We have seen some evidence to this effect in a previous section on predisposing factors.
4. Prolonged excessive alcohol use may also give rise to predispositional changes in the individual, which outside of any alcohol use situations, increase the probability of violent behaviour. An example is brain damage, especially of an epileptiform character.
5. Prolonged excessive alcohol use may be conjunctively connected with alcohol use patterns that also in nonalcoholics may give rise to

> states of the organism that increase the likelihood of aggressive behaviour. Poor nutritional habits when drinking may lead to hypoglycemia and binge drinking may lead to REM-sleep deprivation. Both conditions by themselves increase the likelihood of violent behaviour. In addition, there may be an interaction effect with alcohol use.
>
> 6. "Alcohol use" may indicate different variables for alcoholics and nonalcoholics, so that alcoholics (at least a certain subgroup of alcoholics) display alcohol use, such as use of drinks of high alcohol or congener content, that could show a comparatively strong relationship to violent behaviour.
> 7. Prolonged excessive users of alcohol may, due to developmental or genetic factors, belong to a subpopulation that through a common cause, such as early childhood experiences or affective disorder, show a higher probability of antisocial behaviour and among these, violent behaviour.
> 8. A large proportion of excessive alcohol users are subjected to societal and interpersonal reactions. Some of these may force them into subcultures where violent behaviour is condoned, expected, or technically necessary for functioning within the subculture, and in relating to the larger cultural matrix.
>
> (1976, pp. 435-436).

In addition, Pernanen notes that the "clustering of occasions on which alcohol is used that occurs with the alcoholic also partly explains the statistical association of alcohol and violence".

Virkkunen and others (1994) administered the Karolinska scales of personality or KSP (a Swedish inventory containing 135 questions designed to measure 15 traits) to 58 Finnish "alcoholic, violent offenders and impulsive fire setters" (p. 28) and 21 volunteers who served as a control group. Subjects also completed the Rosenzweig picture frustration test, participated in an oral aspartame and glucose challenge, and underwent various medical laboratory tests. The glucose challenge was used because it was believed that certain types of alcoholics experience a hypoglycemic episode after being given a glucose load. Furthermore, once this occurs, these alcoholics may become particularly irritable and aggressive.

The results of this research led Virkkunen and his associates to conclude:

> . . . alcoholic, impulsive, violent offenders with low CSF 5-HIAA [cerebrospinal fluid 5-hydroxyindoleacetic acid] concentrations have high irritability, impulsivity, and anxiety ratings on the KSP. The subgroup with antisocial personality disorder with high free testosterone and low corticotropin concentrations has low socialization and high monotony avoidance and sensation-seeking ratings on the KSP. All alcoholic offenders have high psychasthenia ratings on the KSP. (p. 32)

No correlation, however, was found between blood glucose nadir and aggression as measured by the Rosenzweig test.

Zhang, Wieczorek, and Welte (1997) analyzed data obtained from the Buffalo Longitudinal Survey of Young Men (BLYSM) in an effort to explain the link between alcohol and violent crime. Using a sample of 625 male 16 to 19 year-old substance abusers, subjects were questioned on issues related to alcohol use, deviant attitudes, aggression, hostility, impulsivity, and problem-solving abilities. Zhang *et al.* conclude that:

> . . . although average drinking behavior has no independent effect on committing aggravated assault, two significant interaction effects are identified. The first one is the interaction between average alcohol consumption and deviant attitudes, which indicates that deviant attitudes increase the likelihood of committing aggravated assault for youths who use more alcohol. The second interaction is between mean alcohol consumption and aggression/hostility. This interaction shows that youths with higher levels of aggression and hostility are more likely to commit aggravated assault when they use more alcohol. These findings suggest that chronic alcohol use is a factor that facilitates violent crime, although it has no independent power for explaining participation in aggravated assault. These findings also suggest that it is a valuable strategy to view alcohol as moderating variable and examine its interaction effects with other major causes of violent crime. Finally, impulsivity is significantly associated with assault in both equations, suggesting that this characteristic has an important independent role in generating violence. (1997, p. 1269)

In addition, according to Zhang *et al.*, alcohol plays only a moderating role and is not a direct cause of alcohol-related violent behaviour.

Alcohol and Domestic Violence

The link between heavy alcohol consumption and marital aggression has been supported by numerous studies (see Leonard, 1993, for a review). Pan, Neidig, and O'Leary (1994) found, in a study of 11,870 Caucasian men, that subjects with an alcohol problem were 70% more likely to commit violent acts against their partners. Increased risk was also associated with having a lower income and being younger.

As with any other type of alcohol-associated aggression, several models have appeared that offer explanations. Leonard and Quigley (1999) suggest three major types of models:

1. The spurious model contends that violence and drinking are both influenced by other factors.
2. The indirect effects model maintains that alcohol consumption creates an unhappy marital environment that provides a setting for domestic violence.
3. The proximal effects of alcohol model sees violence as a direct consequence of alcohol consumption, possibly due to direct pharmacological action.

These models are similar to the models developed to account for alcohol-related violence in general (see Pernanen, 1976).

As part of the Buffalo Newlywed Study (BNS), Leonard and Quigley (1999) followed 366 couples who were applying for a marriage license. Other criteria involved age (between 18 and 29) and the requirement that this was the first marriage for both husband and wife. The object of the BNS was to assess the role of alcohol in marital relations and, accordingly, couples were interviewed when initially approached and after one year had elapsed. Leonard and Quigley conclude that "husband drinking was more likely in episodes of physical *vs.* episodes of verbal aggression" (p. 537). For wives, drinking was found to be "largely unrelated to occurrence or severity of violence" (p. 537). The extent of the involvement of alcohol in episodes of severe physical aggression is further supported by Table 5 which summarizes some of the results of the Leonard and Quigley study.

Table 5

Situational Factors Among Participants
with Verbal, Moderate Physical or Severe
Physical Aggression Episodes, in Percent (Leonard & Quigley, 1999)

	Husband Report			**Wife Report**		
	Verbal (*n*=218)	**Moderate (*n*=45)**	**Severe (*n*=61)**	**Verbal (*n*=211)**	**Moderate (*n*=44)**	**Severe (*n*=67)**
Alcohol involved						
Husband only	0.0	8.9	26.2	7.1	25.0	28.4
Wife only	8.3	0.0	6.6	0.5	0.0	3.0
Both	3.2	2.2	11.5	2.4	2.3	14.9
Total husband	3.2	11.1	37.7	9.5	27.3	43.3
Total wife	11.5	2.2	18.1	2.9	2.3	17.9
Location						
Home	86.4	95.6	83.6	87.3	88.6	80.6
Presence of other people						
Yes	16.4	26.7	26.2	14.8	22.7	44.8

Note. From "Drinking and marital aggression in newlyweds: An event-based analysis of drinking and the occurrence of husband marital aggression", by K. E. Leonard and B. M. Quigley, 1999, Journal of Studies on Alcohol, 60, p.541. Copyright 1999 by Alcohol Research Documentation, Inc., Rutgers Center or Alcohol Studies. Reprinted with permission.

In an examination of affection, aggression, and alcohol abuse in the family setting, Shuntich, Loh, and Katz (1998) gave questionnaires to over 500 college students on three separate occasions. Analysis showed that "measures of alcohol abuse were positively correlated with measures of aggression and negatively correlated with measures of affection" (p. 1058). Children being raised in a home where one or both parents are abusing alcohol run a higher risk of abusing drugs (Hundleby & Mercer, 1987) or becoming juvenile delinquents (Buka & Earle, 1993). At the very least, healthy psychological development and emotional well-being may be severely compromised (Shuntich, Loh, & Katz, 1998).

Alcohol-Induced Automatism

Legislators and members of the legal profession have struggled with the issue of the accountability of intoxicated individuals in cases of serious crimes for at least 200 years (Leonard, 1972). In an English case involving Grindley, who by the standards of the day had committed murder in 1819, the judge, Justice Holroyd, stated that "voluntary drunkenness can not excuse from the commission of crime, yet where as upon a charge of murder the material question is whether an act was premeditated or done only with sudden heat and impulse, the fact of the party being intoxicated has been holden to be a circumstance proper to be taken into consideration" (*cf.* Leonard, 1972, p. 55). Since this time, the question of whether or not someone who is intoxicated has the ability to form a specific intent has often led to a charge of manslaughter instead of murder (Leonard, 1972).

In Canada, Section 33 of the Criminal Code deals with self-induced intoxication. It is generally accepted that the consumption of alcohol can lead to a state referred to as automatism. Automatism has been defined by Kalant (1996) as follows:

> Automatism is a behaviour of which the person is unaware and over which he has no control. It is usually inappropriate in the circumstances, and may be out of character for the individual. It can be complex, coordinated and apparently purposeful and directed, though lacking in judgment. There is usually full or partial amnesia afterwards, for the period in which this behaviour occurred. (p. 631)

Legal scholars have sought explanations for automatism in their examination of the many effects that alcohol has on the central nervous system, including depression of all cognitive functions such as perception, learning, memory, attention, judgment, and reasoning (Wilkinson, 1997). There is still much debate about such effects and their ability to induce a state of automatism.

In cases where the court has ruled that automatism was a factor in a particular crime, the decision is usually based on three factors:

1. The Irrationality of the Crime.
2. Evidence of Amnesia
3. High Blood Alcohol Levels.

(Wilkinson, 1997)

Those charged with crimes often must exhibit abnormal brain activity that is associated with the intoxicated state (Tiffany & Tiffany, 1990).

The following case study provides a good example of alcohol-induced automatism:

> A 34-year-old man, an officer of the law, was involved in an automobile accident in March 1950 and sustained an ecchymosis of the right frontal area . . .
>
> Prior to the accident, he had been able to consume two or three highballs without ill effects. Following the accident he not only developed a severe headache when drinking but could not tolerate alcohol as before, becoming confused, argumentative, and somewhat hostile. On several subsequent occasions he suffered minor episodes of confusion and hostility.
>
> Finally, at 10:30 one morning in February 1951, he went into a bar and had five highballs in rapid succession. While at the bar, he imagined the place to be full of enemies, all with the intention of harming him. He called the F.B.I. on the phone and reported the place to be over-run with spies. He became aggressive and using his revolver, tried to herd the people to one end of the room, firing two shots in the process. One shot went wild, the other fatally injuring a passing pedestrian. He found himself in custody charged with murder by 3:00 that afternoon. The patient claimed amnesia for the period beginning at about 10:30 that morning until 3:00 that afternoon. An officer, on interviewing the people at the bar, found that most all agreed that the man was more crazed than drunk, was out of contact with his surroundings and had a glassy stare. The main symptom was his great fear and hostility.

> Prior to the trial, the judge appointed a board of medical examiners to evaluate the prisoner, and an alcohol electroencephalogram was ordered. The routine electroencephalogram was normal, but after the administration of 3 ounces of alcohol, seizure discharges originated from both anterior and mid-temporal areas. The seizure discharges consisted of paroxysmal theta and spike activity.
>
> The Medical Board concluded that the patient, while in the line of duty, sustained brain damage to the temporal lobes as demonstrated by the electroencephalogram which showed psychomotor seizure. These seizures were apparently precipitated by the alcohol drinks . . . The patient was placed on probation, and followed with routine electroencephalograms at six-month intervals for twelve years. During this period he abstained from alcoholic beverages and there were no recurrences of abnormal behaviour. (Marinacci & Van Hagen, 1972, pp. 8-9)

The relevance of this case to the study of alcohol, anger, aggression, and violence is evident.

Alcohol as a "Disinhibitor" or Stress Reducer

For years, widespread beliefs about the effects of alcohol have existed, specifically tension-reduction and disinhibition. MacAndrew and Edgerton (1969) note that disinhibition has been associated with alcohol consumption at least as far back as the time of Plato. The "disinhibition" model has gained general acceptance in many fields such as medicine, experimental psychology, psychiatry, anthropology, and sociology (Pernanen, 1976). Such a model also implies the existence of some sort of "pent-up" emotions, drive, or taboo behaviour that is somehow kept in check by an inhibitor (possibly due to the presence of cultural or social norms).

Pernanen (1976) refers to numerous researchers who have invoked the idea of disinhibition in their discussion of the effects of alcohol:

> Alcohol is labelled as an agent that "weakens inhibitions" (Fitzpatrick, 1974; Roebuck and Johnson, 1962), "weakens self-control" (Macdonald, 1961); "releases inhibitions" (Shuntick and Taylor, 1972); "liberates impulses and emotion which are normally under control" (Hopwood and Milner, 1940); "liberates deep features of the personality" and consequently "awakens aggressive tendencies" (Medina, 1970). It "reduces inhibitions and self-control," and leads to a "loss of inhibitory capacity and subsequent unleashing of personal predilections" (Hopwood and Milner, 1940); and it has a "disinhibiting effect" (Scott, 1968). It is known as a "disinhibiting, aggression-provoking substance" (Brill, 1970), and "as a trigger of violence" (Blumer, 1973). Its pharmacological role is described as that of "releasing aggression, removing inhibitions, etc." (Glatt, 1965).
> (*cf.* Pernanen, 1976, pp. 393-394)

In reality, the "disinhibition" concept has been rather vague and difficult to prove or disprove in experimental situations. Pernanen (1976) outlines five general ways in which this model has been used:

1. In its descriptive use as a general label for behaviour that is contrary to generally accepted social norms and values.
2. As direct disinhibition reasoning: this can be applied to any explanatory model where a threshold value is needed on an independent variable for the occurrence of an event. No conditional factors are considered causally relevant.
3. The third use is a combination of (1) and (2) and it is the prevalent one in experimental testing of the disinhibitory properties of alcohol. This use explains the disinhibited behaviour (descriptive concept) by the disinhibiting properties of alcohol . . .
4. The fourth use I have called conditional disinhibition reasoning. In this sense any situationally manipulable variable can logically be the disinhibitor, assuming specific values on other causally relevant conditional variables. The resulting values on the dependent variable cannot always be characterized as disinhibited, due to the normative connotations of the concept.
5. The fifth use again is a combination (perhaps it could be called a semantical conglomerate), this time of (1) and (4). Here the conditional variable is such that it can descriptively (in everyday language) be called an inhibitor, as inhibiting behaviour and relevant values on the dependent variable can be characterized as disinhibited. This descriptive use is independent of its use as a label

> for the disinhibition sequence of reasoning. Hetherington and Wray's (1964) conditional variable is such that it lends itself to such an application. The observed dependent variable (aggression) can be socially described as disinhibited and the "high need for social approval" seen as an indicator of social inhibition. (pp. 397-398)

Research has shown that the direct disinhibition model outlined in (2) above is not accurate (Bennett, Buss, & Carpenter, 1969). Other explanations using alternative "disinhibition" concepts have proven difficult to examine empirically.

Alcohol has also often been accepted as a "stress-reducer" (Stritzke, Lang, & Patrick, 1996). Perhaps one of the most widely-held beliefs about alcohol is reflected in the following vignette from the television series "Dallas":

> A public altercation at a major social reception at the Ewing ranch causes conflict, embarrassment and tension. J.R. Ewing, speaking to his father, Jock, sees a passing waitress with champagne and says something in the order of, "Here, you need one of these" as he reaches for a glass of bubbly. Jock replies that he needs "something a lot stronger than that." The two go off to a bar, get intoxicated, reappear happy, laughing and relaxed, and drive home intoxicated but safely. (Wilson, 1988, p. 369).

This is the kind of relief that millions of users of alcohol seek on a regular basis.

Conger (1956) introduced the Tension Reduction Hypothesis of alcohol consumption, based on Mowrer's (1960) two-factor theory of avoidance, which saw the depressant pharmacological effects of alcohol as a means of reducing an underlying drive state of anxiety. More recently, Levenson and Sher have used the term "stress response dampening" to explain the effects of alcohol (Levenson *et al.*, 1980). Unfortunately, it appears that things may not be this simple because alcohol has been observed to have a wide variety of effects. This fact alone is not cause for rejection of these theories because anxiety reduction could result in many different behaviours; however, studies on the relationship of anxiety and alcohol have shown that alcohol might reduce anxiety, increase it, or have no effect at all (Cappell and Greeley, 1987; Pohorecky & Brick, 1983; Sher, 1987).

Surveys of the spectrum of effects reported by users of alcohol give some idea of the frequency and range of individual experiences. Table 6 reproduces the results obtained by Roizen (1983, p. 240). While the largest percentage of respondents indicated an overall increase in positive emotions while drinking, a significant but smaller number of subjects also attested to the possibility of negative consequences. This has led to the conclusion that alcohol sometimes reduces anxiety in some individuals (Wilson, 1988). As Goodwin (1986) put it: "if a drug company tried to get FDA approval to market alcohol for anxiety, it would probably be turned down" (p. 57).

The latest review of research findings in this area has led to several conclusions. First of all, according to Stritzke, Lang, and Patrick (1996), alcohol has a general dampening effect on autonomic arousal, regardless of the emotions involved.

Secondly, in their words:

> There is also considerable evidence consistent with the idea that alcohol's effects on autonomic and self-report reactions to real or anticipated

Table 6 Frequencies of Positive Reports of Effects
(Base: 605 Current Drinkers
who responded to at least one of the effects questions) (Roizen, 1983)

Effect	**Frequencies of Reported Effects**[1]			
	"Never"	**"At Least Sometimes"**	**"At Least Usually"**	**"Always"**
Friendly	21	79	43	10
Talkative	21	79	40	9
Sleepy	20	80	30	8
Romantic	30	70	25	7
Sick	48	52	7	3
Irrational	52	48	8	3
Aggressive	62	38	8	1
Dizzy	66	34	4	1
Argumentative	66	34	2	1
Sad	82	18	2	1
Mean	85	15	2	1
Tastes Bad	57	44	9	3

[1] This table reports the frequencies of four levels of response to the effects questions: the **never** column simply shows the frequency of **never** responses; the **at least sometimes** column reports the combined frequency of **sometimes, usually,** and **always** responses; the **at least usually** column reports the combined frequency of **usually** and **always** responses; and, finally, the **always** column shows the frequencies of respondents choosing the **always** response.

[2] Only the **"never"** and **"at least sometimes"** columns of this table, reading across, will total 100 percent, give or take the consequences of rounding, because of cumulated responses.

Note. This material is not copyrighted, and is in the public domain according to the National Institute on Alcohol Abuse (Washington, D.C.) who published it.

stressors are mediated by its impact on higher cognitive processes such as self-awareness (Hull, 1981), appraisal (Sayette, 1993), and attention (Steele & Josephs, 1988, 1990). Tension-reducing effects of alcohol are most reliably obtained in contexts where a somewhat distal stressor is

> anticipated, the threat is accompanied by distraction, and perhaps 'self-focused awareness' is the source of stress. For example, Curtin *et al.* (1995) found that alcohol blocked fear-potentiated startle only when attentional resources were diverted from an ongoing threat cue by a salient, nonaversive distracter. Steele and Josephs (1990) reasoned further that the specific valence of a distracter is critical because alcohol may actually enhance negative emotional response if attention is directed toward a distracter that is also aversive, and some research seems to support this hypothesis. (Sayette & Wilson, 1991, p. 388)

All of this may be complicated by the fact that reactions are dependent on blood alcohol levels.

Some Other Considerations

The potential for actual physical changes in the alcoholic's brain should also be considered when examining the causes of anger in alcoholics. Gottchalk, Hoigaard-Martin, Eckardt, Gilbert, and Wolf (1983) used speech content analysis to determine that chronic alcoholics exhibit significant cognitive impairment after detoxification. Yudofsky, Stevens, Silver, Barsa, & Williams (1984) report on a specific case involving a 40-year-old male subject who had been abusing alcohol for 20 years. His symptoms included "Korsakoff's psychosis associated with severe rage outbursts, agitation, and violent behaviour not responsive to traditional psychopharmacologic and behaviour interventions . . ." (p. 114). The authors, who were all physicians, chose to treat the patient with propranolol and were apparently successful in controlling his violent behaviour. Citing previous research that point to specific neurophysiological changes that would explain that behaviour changes, the authors state that . . . .

> If increased ß-adrenergic receptor supersensitivity or a high number of sites is, in fact related to dyscontrol of rage and violence, centrally acting ß blockers may indeed treat this dyscontrol. Propranolol, a lipid-soluble substance that passes through the blood-brain barrier and concentrates diffusely in the brain, has been shown to decrease the elevated 24-hour urinary epinephrine levels found in alcohol withdrawal . . . and decrease the CSF MHPG levels in psychotic patients . . . (p. 115)

This line of reasoning suggests that major irreversible physiological changes may be responsible for the altered emotional state of the alcoholic in a small number of cases. In addition, alcoholics who exhibit a chronic pattern of drinking over long periods of time are also more likely to be suffering from REM-sleep deprivation and poor nutrition, leading to metabolic disturbances. Both of these factors have been linked to violent and aggressive behaviour (Parnanen, 1976).

Finally, in a general discussion of alcohol, aggression, and violence, Marjot (1989) stresses the role of situational factors and provocation when he reflects on how to deal with an intoxicated individual:

> Treat the intoxicated person with respect, be courteous and do not behave towards him as if he were either a child or an imbecile. Do not be provoked into anger or argument. Speak softly, clearly, and in a friendly fashion. Adopt a benign expression and avoid the challenging look or

> bodily attitude. If possible stay out of range at a comfortable distance and keep your hands in sight . . . Do not stare at the person but keep glancing at him in an animated friendly manner . . . you are not making judgment of the behaviour, good or bad, legal or illegal. (p. 294)

The Measurement of Anger

Early attempts at assessment in this general area made use of hostility inventories. Most significant among these were the Buss-Durkee Hostility Inventory (Buss & Durkee, 1957) which has now been revised by Buss and Perry (1992) and released as the Buss-Perry Aggression Questionnaire (BPAQ). The BPAQ now considers anger to be a critical factor in aggression and assesses it separately. Other instruments that have been developed include the Reaction Inventory (Evans & Strangeland, 1971), the Anger Inventory (Novaco, 1975), and the Anger Self-Report (Zelin, Adler, & Myerson, 1972). None of these inventories seems up to the task of gauging anger and its various elements; the Anger Inventory appears to have reliability problems (Biaggio, Supplee, & Curtis, 1981) and all three instruments fail to distinguish adequately between state and trait anger.

Building on a working definition of state and trait anger, Spielberger (1980) developed the State-Trait Anger Scale (STAS). Spielberger saw State anger (S-Anger) as

> ...a psychobiological state or condition consisting of subjective feelings that vary in intensity, from mild irritation or annoyance to intense fury and rage, with concomitant activation or arousal of the autonomic nervous system. It was assumed that S-Anger would fluctuate over time as a function of frustration, perceived affronts, injustice or being verbally or physically attacked. (Spielberger, Reheiser, & Sydeman, 1995, p. 55)

Similarly, Trait anger (T-Anger) was seen as an indication of how frequently angry feelings were experienced. Individuals possessing high Trait anger scores would perceive a greater number of situations as irritating, annoying, or frustrating and would be more likely to experience State anger in response to these situations than persons with low Trait anger scores (Spielberger, 1996).

The construction of the STAS included item generation, item analysis, and factor analysis. A four-point Likert scale was used for the S-Anger scale that provided the following choices: (1) not at all, (2) somewhat, (3) moderately so, and (4) very much so. Similarly, the choices for the T-Anger scale were: almost never, sometimes, often, and almost always. Based on the results of the factor analysis, the T-Anger scale was divided into Angry Temperament (T-Anger/T) and Angry Reaction (T-Anger/R) subscales. T-Anger/T reflects "individual differences in the disposition to experience anger" (Spielberger, Reheiser, & Sydeman, 1995, p. 55) while T-Anger/R pinpoints angry feelings when situations involving frustration and/or negative evaluations are experienced. In its final form, the State-Trait Anger Scale consisted of ten items for each of the State and Trait anger scales, while the subscales of the Trait anger scale (T-Anger/ T and T-Anger/R) were each based on four items.

In order to address the need to measure even more aspects of anger, Spielberger (1986) enlarged the original STAS to form the State-Trait Anger Expression Inventory (STAXI) with the addition of several anger expression scales. Research conducted by Harburg and others (Harburg, Blakelock, & Roeper, 1979); Harburg, Erfurt, Hauenstein, Chape, Schull, & Schork, 1973) suggested that the concepts of anger-in and anger-out, originally defined and investigated by Funkenstein and his colleagues in the 1950's (Funkenstein, King, & Drolette, 1954), were important due to their varied effects on the human cardiovascular system. Anger-in and Anger-out scales were incorporated into the STAXI in order to assess these constructs. Analyses related to the Anger-In and Anger-Out scales pointed to the existence of a separate Anger Control factor which became part of the STAXI. The last scale to be added was an Anger Expression scale that was a composite of the Anger-in, Anger-out, and Anger Control scales. The development of the new STAXI scales was similar to the existing State and Trait Anger scales of the STAS.

The STAXI (Spielberger, 1986) has a number of definitions associated with it, some of which are similar to those used with the STAS, that are summarized in the manual:

> The experience of anger, as measure by the STAXI, is conceptualized as having two major components -- state and trait anger. State anger is defined as an emotional state marked by subjective feelings that vary in intensity from mild annoyance or irritation to intense fury and rage. State anger is generally accompanied by muscular tension and arousal of the autonomic nervous system. Over time, the intensity of state anger varies as a function of perceived injustice, attack or unfair treatment by others, and frustration resulting from barriers to goal-directed behaviour. Trait anger is defined as the disposition to perceive a wide range of situations as annoying or frustrating, and the tendency to respond to such situations with more frequent elevations in state anger, individuals high in trait anger

> experience state anger more often and with greater intensity than individuals low in trait anger.
>
> Anger expression is conceptualized as having three major components. The first component involves the expression of anger toward other people or objects in the environment (Anger-out). The second component of anger expression is anger directed inward -- that is holding in or suppressing angry feelings (Anger-in). Individual differences in the extent to which a person attempts to control the expression of anger (Anger Control constitutes the third component of anger expression).
>
> (Spielberger, 1988, p. 1)

The Anger Expression scale was designed to provide "a general index of the frequency that anger is expressed, regardless of the direction of the expression" (Spielberger, 1988, p. 1).

The original (Spielberger, 1986) version of the STAXI consists of 44 self-report items that are scored on six scales and two subscales, which are:

State Anger (S-Anger); 10 items
Trait Anger (T-Anger); 10 items, with two subscales
Angry Temperament (T-Anger/T); 4 items
Angry Reaction (T-Anger/T); 4 items
Anger-in (AX/In); 8 items
Anger-out (AX/Out); 8 items
Anger Control (AX/Con); 8 items

Anger Expression (AX/EX); 24 items

For each scale and subscale, the alpha coefficients are presented for both males and females in Table 7 below. This measure, introduced by Cronbach, is an indication of internal consistency or item homogeneity and can be considered to be adequate when a value of around .80 is achieved (Nunally, 1978).

Table 7 Alpha Coefficients for STAXI Scales and Subscales

STAXI Scale	**Males**	**Females**
S-Anger	.90	.91
T-Anger	.82	.82
T-Anger/T Subscale	.89	.88
T-Anger/R Subscale	.69	.69
AX/In	.86	.81
AX/Out	.75	.78
AX/Con	.81	.85

(Spielberger, 1996).

Over the years, a number of studies have attested to the reliability and validity of the STAXI's various scales and subscales. Jacobs, Latham, and Brown (1988) examined the test-retest reliability of the STAXI scales over a two-week period as part of a group of inventories given to 395 undergraduate students. These included the State-Trait Personality Inventory (STPI; Spielberger, 1979), and the additional STAXI scales not found on this inventory. The results, which appear in Table 8, show moderate correlations

Table 8 Fourteen Day Test-Retest Reliability Coefficients for the STPI and the Anger Expression Scales of the STAXI for Male and Female Undergraduates (Jacobs, Latham & Brown, 1988)

Subscales	Males	Females
STPI		
State Anxiety	0.43	0.37
State Anger	0.27	0.21
State Curiosity	0.44	0.31
Trait Anxiety	0.66	0.81
Trait Anger	0.70	0.77
Angry Temperament	0.62	0.81
Angry Reaction	0.69	0.72
Trait Curiosity	0.61	0.67
AX Scales		
Anger-Out	0.66	0.81
Anger-In	0.64	0.78
Anger-Control	0.70	0.73
AX/EX	0.68	0.76

Note. From "Test-retest reliability of the State-Trait Personality Inventory and the Anger Expression Scale", by G. A. Jacobs and L. E. Latham, 1988, Anxiety Research, 1, p.265. Copyright 1988 by Gordon and Breach Publishing Group. Reprinted with permission.

for the State Anger scale. This supports the stability of the trait measure and the transitory nature of the state scale.

The T-Anger scores found for a group of 280 undergraduate college students and 270 U.S. Navy recruits on the STAXI were correlated with scores obtained on the Buss-Durkee Hostility Inventory (Buss & Durkee, 1957), and the "Special" Hostility (Cook & Medley, 1954) and Overt Hostility (Schultz, 1954), scales of the Minnesota Multiphasic

Table 9 Correlations of T-Anger Scales With Measure of Hostility (Spielberger, 1996)

	T-Anger			
	College		Navy	
Scale	M	F	M	F
BDHI Total score	71***	66***	66***	73***
MMPI *Ho*	59***	43***	49***	48***
MMPI *Hv*	32***	27***	31***	30***

Note. Decimals omitted for all correlations. BDHI=Buss-Durkee Hostility Inventory; *Ho* = Hostility; *Hv* = Overt Hostility.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Note. From State-Trait Anger Expression Inventory: Professional manual (p.19), by C. D. Spielberger, 1996, Odessa, FL: Psychological Assessment Resources. Copyright 1996 by Psychological Assessment Resources, Inc. Reprinted with permission.

Personality Inventory. The results, which can be found in Table 9 reveal significant correlations in all cases for both sexes and demonstrate that the T-Anger scale has concurrent validity. The S-Anger scale has been correlated with the Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975), and the Trait Anxiety, Trait Curiosity, State Anxiety, and State Curiosity scales of the State-Trait Personality Inventory (STPI; Spielberger *et al.*, 1979). Results (Table 10) for a large sample of college students (545 females; 334 males) show that the S-Anger scale correlates significantly with the EPQ "Neuroticism" and "Psychoticism" scales. As well, moderate correlations were found between the S-Anger scale and the State-Anxiety, State-Curiosity (for females only), Trait-Anxiety, and Trait-Curiosity scales of the STPI (Spielberger, 1988). This is as predicted by clinical theory and experience because highly "neurotic" and "anxious" individuals often have considerable difficulty expressing emotions. (MacKinnon & Michels, 1971)

In order to assess the validity of the Anger Expression Scales of the STAXI, the Anger-in (AX/In), Anger-out (AX/Out), and Anger-Expression (AX/EX) scales of the STAXI were correlated with responses to Harburg *et al.*'s (1979) Teacher and Movie vignettes (hypothetical anger-provoking situations), the S-Anger, T-Anger, T-Anger/T, and T-Anger/R scales of the STAXI, and the S-Anxiety, T-Anxiety, S-Curiosity, and T-Curiosity scales of the State-Trait Personality Inventory (Spielberger, 1985). As shown in Tables 10 and 11, significant correlations were found in all instances with the exceptions of AX/EX *vs.* S-Curiosity and T-Curiosity. The lack of any significant correlations for S-Curiosity and T-Curiosity has been cited as evidence of the discriminant validity of the Anger Expression Scales. Similarly, all other significant correlations attest to the convergent validity of these scales. Further evidence of the validity of the abbreviated versions of the Anger Expression Scales was provided by Johnson (1984), who correlated scores on these scales with systolic and diastolic blood pressures for a large group of high school students and obtained highly significant results (Table 12).

A factor analysis of the STAXI by Fuqua *et al.* (1991) using 455 undergraduate students found that a seven-factor solution using a varimax rotation provided the best fit. Four of the identified factors corresponded to the STAXI S-Anger, AX/Con, AX/In and AX/Out scales while two others were identified as the T-Anger/T and T-Anger/R subscales. However the seventh identified factor pointed to the existence of a second

Table 10 Correlations of T-Anger and S-Anger Scales With Other Personality Scales (Spielberger, 1996)

Scale	S-Anger		T-Anger	
	M	F	M	F
EPQ Extraversion	-03	-08	06	-07
EPQ Neuroticism	43***	27***	50***	49***
EPQ Psychoticism	26***	27***	21***	20***
EPQ Lie	-11	-04	-20***	-25***
STPI S-Anxiety	63***	63***	19***	25***
STPI S-Curiosity	-07	-18***	-15**	-08
STPI T-Anxiety	35***	30***	37***	38***
STPI T-Curiosity	-20***	-12**	-08	-07

Note: Decimals omitted for all correlations. M = Male; F = Female;
EPQ = Eysenck Personality Questionnaire; STPI = State-Trait Personality Inventory.
*p < .05. **p < .01. **p < .001.

Note. From State-Trait Anger Expression Inventory: Professional manual (p.20), by C. D. Spielberger, 1996, Odessa, FL: Psychological Assessment Resources. Copyright 1996 by Psychological Assessment Resources, Inc. Reprinted with permission.

S-Anger factor. The results of Vander Ploeg's (1988) study, using a Dutch version of the STAS, tended to confirm this finding.

Forgays, Forgays, and Spielberger (1997) also used a large sample (n = 714) of undergraduate college students in their principal components factor analysis of the STAXI, which also examined specific gender related differences in its structure. The analysis generally confirmed previous results, having identified six factors corresponding to S-Anger, AX/Con, AX/In, AX/Out, T-Anger/T and T-Anger/R. A seventh factor was based primarily on S-Anger items, and further analysis yielded two additional S-Anger factors: "Feeling Angry" and "Feel Like Expressing Anger". Based on gender differences in responses, Forgays *et al.* noted that "the physical expression of anger represents a more

Table 11 Anger Expression Scale Correlations (Spielberger, 1996)

	AX/In		AX/Out		AX/EX^a	
Scale	**M**	**F**	**M**	**F**	**M**	**F**
Anger-provoking situations						
Angry teacher	-36***	-31***	26***	36***	46***	49***
Movie line	-42***	-26***	24***	29***	49***	41***
STAXI scales						
S-Anger	23***	24***	10*	09*	-11**	-12**
T-Anger	24***	29***	52***	58***	14***	20***
T-Anger/T	12**	16***	47***	50***	21***	25***
T-Anger/R	34***	33***	24***	30***	-13**	-04
STPI scales						
S-Anxiety	27***	28***	10*	07	-12**	-14
T-Anxiety	24***	30***	26***	26***	00	-01
S-Curiosity	03	06	-02	00	-07	-08
T-Curiosity	-03	-01	02	00	-03	-03

Note: Decimals omitted. M = Male; F = Female; STPI = State-Trait Personality Inventory.
^{a}An earlier version of the AX/EX scale which did not include the AX/Con adjustment.
**p* < .05. ***p* < .01. ****p* < .001.

Note. From State-Trait Anger Expression Inventory: Professional manual (p.21), by C. D. Spielberger, 1996, Odessa, FL: Psychological Assessment Resources. Copyright 1996 by Psychological Assessment Resources, Inc. Reprinted with permission.

distinctive and significant decision for women than for men" (p. 505). Gender differences were also evident in the loadings for the AX/In and AX/Out scales, with men being more likely to openly express their anger while women tended to pout, sulk, or be secretly critical of others in similar circumstances.

Table 12 Anger Expression Scale Correlations
With Blood Pressure Measures (Spielberger, 1996)

	Males		Females	
Scale	SBP	DBP	SBP	DBP
AX/In	47***	29***	27***	16***
AX/Out	-13**	-09*	-13**	05
AX/EX[a]	-45***	-27***	-30***	-16***

Note: Decimals omitted. SBP = systolic blood pressure; DBP = diastolic blood pressure.
[a] An earlier version of the AX/EX scale, which did not include the AX/Con adjustment.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Note. From State-Trait Anger Expression Inventory: Professional manual (p.21), by C. D. Spielberger, 1996, Odessa, FL: Psychological Assessment Resources. Copyright 1996 by Psychological Assessment Resources, Inc. Reprinted with permission.

Perhaps influenced by the results of the various factor analyses, Spielberger and his colleagues published the 69-item STAXI-ETF in 1995, and the 57-item STAXI-2 in 1998. Many of the original scales remained the same on the STAXI-ETF. The State Anger scale has been expanded to 15 items and now contains three 5-item subscales: Feeling Angry (F), Feel Like Expressing Anger Verbally (V), and Feel Like Expressing Anger Physically (P). The Anger Control Scale has been revised to assess differences in controlling the outward expression of anger (AX/Con-Out), and the reduction in suppressed anger (AX/Con-In) (Spielberger, 1998). To summarize, the new scales and subscales are:

State Anger (S-Anger): 15 items

Feeling Angry (F): 5 items

Feel Like Expressing Anger Verbally (V): 5 items

Feel Like Expressing Anger Physically (P): 5 items

Anger Control In (AX/Con-In): 8 items

Anger Control Out (AX/Con-Out): 8 items

All of the original STAXI items are used on the STAXI-ETF and contribute to the scale and subscale scores. Although the STAXI-ETF contains 25 more items than the original STAXI, only 13 of these are used to obtain scale and subscale scores. The STAXI-2 is essentially a STAXI-ETF minus the remaining 12 unused items. As yet, no norms are available for the new scales and a manual for the STAXI-2 has not been published. It should be noted that any of the original STAXI scores can be readily obtained from either the STAXI-ETF or STAXI-2 answer sheet and that the two more recent versions share much of the careful psychometric development that went into the STAXI.

In an independent review of the STAXI, Moses (1992) concluded that the STAXI:

> . . . is a specific, sensitive, psychometric instrument that can become invaluable in the assessment of some aspects of stress-related symptomatology in health and disease states as well as in the investigation of normal personality processes. Its promise is most likely to be fulfilled when it is used in conjunction with other specific behavioural and physiological indices to study specific adjustment patterns. If future applications of the STAXI are as experimentally rigorous as the development of this measure, there is great potential for its use to significantly further our understanding of important stress-based and stress-induced syndromes and to help in identifying effective means by which such disorders may be reversed and prevented. (p. 524)

Indeed, much of the initial research involving the STPI or the STAXI dealt with anger and its relationship to hypertension and coronary heart disease (Booth-Kewley & Friedman, 1987; Crane, 1982; Herschberger, 1985; Kearns, 1985; Schneider, Egan & Johnson, 1986). Others have focused on research using the STAXI with chronic pain sufferers (Ham, Andrasik, Packard, & Bundrick, 1994; Curtis & Kalichman, 1986). Studies that have dealt with psychological concerns include those by Deffenbacher, Demm & Brandon (1986) and Hazeleus & Deffenbacher (1986) who looked at anger and anger management, while Ham, Andrasik, Packard & Bundrick (1994) used the STAXI with individuals suffering from chronic post-traumatic headaches.

More recently, the STAXI has been translated into a number of other languages to enhance its versatility and to examine the seemingly universal experience of anger. These include German (Schwenkmezger & Hodapp, 1991), Italian (DeMoja & Spielberger, 1997), Norwegian (Haseth, 1996), Czechoslovakian (Stuchlikova, Man, & Spielberger, 1995), Russian (Kassinove, Sukhodolsky, Eckhardt, & Tystsarev, 1997), and French-Canadian (Laughrea, Belanger, & Wright, 1997).

Age and Gender Differences on STAXI Scales

Age and gender differences on certain 44-item STAXI scales were investigated by Stoner and Spencer, and their findings were published in two separate articles (1986; 1987). The first article deals with the State and Trait-Anger scales while the second looks at the Anger-In, Anger-Out, and Anger Expression scales. It appears that all of their results were generated from a single administration of the scales involved to 150 volunteers ranging in age from 21 to 83 years. This sample was subdivided into three groups based on age, namely young adults (21 to 39 yrs.), "middle-age" (40 to 59 yrs.), and "old" (60 to 83 yrs.). Statistical analysis was performed using a 3 (Age Group) x 2 (Gender of Subject) Analysis of Covariance (ANCOVA) with educational level as the covariate.

No significant main effect was found for either gender or age group on the State and Trait-Anger scales, and no significant interaction occurred. For the Anger-Out scale, young adults scored significantly higher than "old" subjects. Similarly, the young and "middle-age" groups scored significantly higher on the Anger-Expression scale than did "old" individuals. Again, no gender differences were indicated.

Chapter III: Methods

Subjects

The sample consisted of 76 "alcoholics" who entered the Alberta Alcohol and Drug Abuse Commission (AADAC) Recovery Centre in downtown Edmonton for alcohol detoxification and volunteered to participate in this study. These were individuals who, by their own admission, had a problematic pattern of alcohol use and whose "drug" of choice was alcohol. They were under the influence of alcohol upon entry to the detoxification centre, and indicated that they had consumed alcohol within the last eight hours. A total of 80 potential subjects were approached by the researcher but four refused to participate. Exactly half of the volunteer subjects (24 males and 14 females) completed the study while the other half (33 males and 5 females) did not. The average ages for males and females in the "completed" group were 43.8 and 43.15, respectively. No other demographic data were collected or necessary in order to complete the analyses outlined in Chapter 1. The subjects who participated in this study represent a convenience sample.

Instrument

Data collection was accomplished with the administration of the 69-item STAXI - ETF (Spielberger, 1995) on three occasions. This inventory is described in Chapter II and can be found in Appendix A.

Procedure

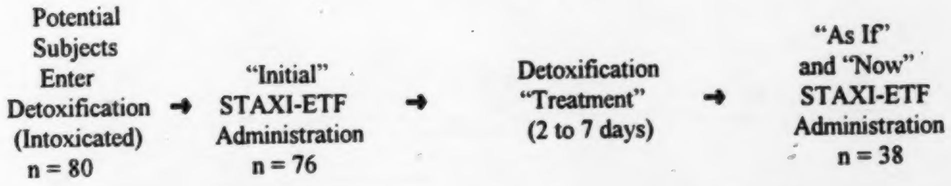
Potential subjects who met the criteria outlined above were initially asked if they were willing to participate in the present study by AADAC staff. The researcher was either on site or alerted to the presence of a potential subject by the staff of the detoxification centre by telephone. In the latter case, the researcher typically arrived at the detoxification centre within about 20 minutes.

The identified individuals were greeted and introduced to the researcher who subsequently presented a brief overview of the study, including an estimate of the length of time required to respond to the items involved, and were asked if they would be willing to participate. Volunteer subjects were then led a short distance into another private room and were seated. A consent form was then read to them after which they were asked if they understood what was read and if so, their signature was requested. The researcher also signed and dated the consent form. The main points on the consent form (a copy of which can be found in Appendix B) included a brief description of what each subject was asked to do, a restatement of the voluntary nature of their participation, and a guarantee of confidentiality. The consent form was approved by both the Ethics Review Committee in the Department of Educational Psychology at the University of Alberta and by AADAC.

All volunteer subjects were administered the 69-item STAXI-ETF. The various response choices were explained to these subjects and the items on the STAXI-ETF were read aloud by the researcher who also recorded their responses. At the conclusion of the first interview (the "intoxicated" condition), these subjects were asked if they would be willing to respond to the items on the STAXI-ETF again in a few days.

After the subjects had "sobered up" and experienced alcohol "withdrawal"as determined by the AADAC nursing staff (using measures such as blood pressure, pulse rate, and level of anxiety), they were approached by the researcher and asked if they would be willing to respond to the 69-item STAXI-ETF two more times. For the second administration, the subjects who agreed were asked to respond to the items as if they were intoxicated (the "as if" condition which reflects their sober perceptions of their intoxicated states). Their responses to the third administration were to reflect the way they felt at that time (the sober or "now" condition). The same room was used and the subjects were, once again, presented with and asked to sign the consent form in order to ensure that consent was not only obtained under conditions of diminished capacity, i.e. while intoxicated. The first, second, and third administrations are referred to as the "initial", "as if", and "now" responses in the remainder of this dissertation. The second and third administrations were, as a rule, done one after the other. The researcher also tried to avoid interviews which would have conflicted with other scheduled activities such as Alcoholics Anonymous meetings. The data collection procedure is summarized in Figure 3.

Figure 3: Data Collection Procedure


Potential Subjects Enter Detoxification (Intoxicated) n = 80
"Initial" STAXI-ETF Administration n = 76
Detoxification "Treatment" (2 to 7 days)
"As If" and "Now" STAXI-ETF Administration n = 38

Thirty-eight of the subjects who responded to the initial administration of the STAXI-ETF left detoxification prematurely and, as a result, could not be assessed a second or third time. This group is referred to as the "uncompleted" group, while the group of subjects for whom the three sets of responses to the STAXI-ETF were obtained are referred to as the "completed" group.

The length of each interview varied considerably between volunteer subjects. Some subjects were eager to discuss their problems and present situation while others responded only to the STAXI items. As a psychologist, the researcher indulged, to some extent, those who wanted to discuss things.

Data Analysis

In the choice of an appropriate statistical level of significance (α) for a particular study, consideration is given to the consequences of Type 1 and Type 2 errors in the decision-making process related to the rejection or non-rejection of the null hypothesis. Type 1 error occurs when a true null hypothesis is rejected, while Type 2 error involves the failure to reject a false null hypothesis (Winer, Brown, & Michels, 1991). Type 1 error can be controlled for, and the probability of a Type 1 error is set by the researcher. Type 2 error (β) and power are determined by the effect size in a particular test, the number of subjects, and the value of α. The power of a test is the probability of correctly rejecting a false null nypothesis and should be relatively high (power = 1 - β).

For the present study, Type 2 errors could have an unjustified adverse effect on future research into the effects of alcohol on anger. Type 1 errors might increase the amount of research done in this area for no good reason. The acceptance of this work as fact by others when either type of error has occurred would be detrimental. A decision was made to minimize Type 2 errors in this study since such errors are potentially more serious. If Type 1 errors occur, further work in this area would most likely clarify the situation. By choosing $\alpha = .05$ (a generally accepted maximum), the probability of a Type 1 error will equal this value and the possibility of a Type 2 error will be minimized. In preliminary research or pilot studies, α is usually .05 while a figure of .01 may be used in well-developed fields with good experimental control (Coldeway, 1989). In addition, a value of .05 for α is the highest generally accepted figure for studies in the social sciences.

It should be noted that while the nominal value of α is given as .05, this may be reduced considerably for analyses that involve multiple comparisons using several categories. In order to correct for the increased probability of committing a Type 1 error when several tests are performed (approximately equal to the number of tests multiplied by α), it is customary to divide the nominal α by the number of tests to arrive at an "individual" α to be used in the analysis (Winer, Brown, & Michels, 1991). This rule was used, within reason, taking into consideration the fact that significant results tend to become very elusive as α drops to .001.

The major statistical procedure used in the present study was repeated measures analysis of variance (ANOVA). The assumption of homogeneity of variance-covariance is inherent in the use of this statistical method. Although F tests are fairly robust when it comes to this assumption, it is wise to seek confirming evidence (Winer, 1971). The initial computer output for the ANOVA used in this study gave the statistical significance for the effects of time based on four methods (Sphericity Assumed, Greenhouse-Geisser, Huynh-Feldt, and Lower-bound). The results were essentially the same with each method, thus supporting the tenability of the assumptions.

Dr. Charles Spielberger was consulted in the preliminary stages of this research project and supplied the researcher with the newer, 69-item version of the STAXI. As a result, much of the analysis was done using this version. However, where comparisons with norms or the results of other studies were made, the comparisons used only the six scale and two subscale scores derived from responses to the 44-items that were common to both the newer 69-item STAXI and the earlier 44-item STAXI.

The 69-item STAXI responses given by the subjects along with their genders and age categories (39 years and under, 40 years and above) were entered into a computer using Microsoft Excel. The various 44 and 69-item STAXI scale/subscale scores were then calculated using information provided by C. D. Spielberger (personal communication, August 27, 1998). Further statistical analyses were accomplished using SPSS version 9.0 (SPSS Inc., 1998).

The statistical treatment of the data was done in two phases. Phase I involved comparisons relevant to the 44-item STAXI while phase II dealt with the repeated measures design for which the 69-item STAXI was used. A summary follows.

Phase I

1. The calculation of the means, standard deviations, and reliabilities (Cronbach's α) for males for all administrations on each of the 44-item STAXI scales and subscales. Two-tailed, one-sample t-tests were then used to determine if the calculated means were significantly different, at an α of .01, from the means for the male adult norm sample (Spielberger, 1996a). The .01 level of significance was chosen as being close to .05

divided by the number of scales and subscales (8) in order to reduce the probability of a Type 1 error.

2. The calculation of the means, standard deviations, and reliabilities (Cronbach's α) for females for all administrations on each of the 44-item STAXI scales and subscales. Two-tailed, one-sample t-tests were then used to determine if the calculated means were significantly different, at an α of .01, from the means for the female adult norm sample (Spielberger, 1996).

Phase II

1. The calculation of the means, standard deviations, and reliability values (Cronbach's α) for males for all administrations on each of the 69-item STAXI scales and subscales.
2. The calculation of the means, standard deviations, and reliability values (Cronbach's α) for females for all administrations on each of the 69-item STAXI scales and subscales.
3. A univariate 2 x 2 x 3 (age by gender by occasion) repeated measures analysis of variance (ANOVA) for each of the 69-item STAXI scales and subscales with occasion ("initial", "as if", and "now") as a within subjects factor and between subjects factors of age category and gender. Once again, the level of significance was taken roughly as .05 divided by the number of STAXI scales and subscales (11), and a figure for α of .005 was adopted. Pairwise comparisons between the means obtained on different

occasions were made using the Bonferroni procedure (Winer, Brown, & Michels, 1991) when a significant F value was found for the ANOVA.

The age categories used (39 years and under, 40 years and above) correspond with age categories used in other studies, such as those by Stoner and Spencer (1987; 1986). There were insufficient numbers of volunteer subjects under the age of 30 years to include a younger, third age category.

Chapter IV: Results

Some Comments on the Interviews

Over 150 interviews were conducted in order to collect the data used in this study. Approximately 90 per cent of the interviews lasted a half hour or less, with the longest being approximately two hours. The word "needy" was often used by detoxification centre staff to characterize those that appeared for treatment. Most subjects appeared self-centered, ready to talk about their problems at length with anyone who would listen, and relatively unconcerned with the negative consequences of their drinking for themselves and for those around them in their daily lives. Many of them had been through the detoxification process more than once. In the most extreme case, one individual reported making his seventieth visit.

For the most part, subjects were very cooperative and were often glad to see the researcher on the follow-up visit for the second and third STAXI administrations. Four males were openly hostile or exhibited paranoid signs and symptoms when initially approached and, as a consequence, would not participate in the study. Three individuals refused to sign the consent form, believing that because a psychologist was involved, they were somehow being set up to be involuntarily locked up at a psychiatric facility. One male's quick reply to a request for participation in the study was verbally abusive and laced with profane language. Any further thoughts of gaining his cooperation were quickly abandoned. One woman, who showed no hostility, could not remember who the researcher was at the time of the second interview. Subsequently, she did complete the "as if" and "now" responses to the STAXI.

Although it was believed that most subjects exhibited a decrease in overall anger levels in the sober state, there were individual examples that contradicted these trends. For example, at least one person remarked that he was a "happy drunk" and this seemed to be an accurate assessment. Once sober, he became somewhat quiet, withdrawn, and irritable. Indeed, a large number of subjects appeared to be more outgoing while intoxicated. Other statistical trends were often supported by observations made during the interviews. Several people commented that they were "mad at themselves" in response to the STAXI items dealing specifically with anger, thus supporting the prevalence of high Anger-In scores.

As reported earlier, no biodemographic data other than gender was collected. However, anecdotal evidence about who these people were came up informally during the interviews, particularly where the subjects were more outgoing or wanted to talk. This information indicated that the subjects came from all levels of society. Some reported they were homeless and had no assets other than what they carried with them, and that they were virtually penniless and had to resort to borrowing change in order to make phone calls. They often left the detoxification centre not knowing where they were going. At the other end of the spectrum, a small number of "alcoholics" seen during the course of the study were well off financially, with one reporting earnings in excess of $100,000 per year. Occasionally, going through detoxification was required by an employer.

Two individuals of North-American Indian extraction took part in the study. Several subjects appeared to have been European immigrants. Once or twice the initial interview was abandoned when it became apparent that a large number of STAXI items required explanations due to their poor grasp of the English language.

Half of the subjects who were initially interviewed left detoxification prematurely. The reasons for their early departures vary, but included the need for another drink, conflicts with others (both staff members and those going through detoxification), and their apparent desire or perceived need to return to work. Consequently, for these individuals the second and third sets of STAXI responses were unobtainable and together these participants made up the "uncompleted" group. Some of those with serious or potentially fatal alcohol-related physical problems left detoxification within 24 hours, still convinced that they could quit without anyone's help.

The subjects used in this study represent a very specific subset of the alcoholic population. First of all, these alcoholics seemingly have some desire to stop drinking. Secondly, those who participated in the study entered detoxification in an intoxicated state. It is against AADAC policy to actually allow someone who is intoxicated past the first stage of assessment *i.e.*, to give them a bed. This is generally known by those who appear, some of whom get totally inebriated for the occasion. This is a form of resistance. Of all of the alcoholics who enter detoxification, AADAC staff indicated that only a small percentage arrived in a drunken state. Those that do may represent a somewhat Passive-Aggressive subgroup of all the alcoholics in detoxification.

The Phase I Statistical Analysis

The male and female means, standard deviations, and reliability figures (Cronbach's α) obtained in the present study for the 44-item STAXI scales and subscales are reported in Tables 13 and 14, respectively. t-test comparisons with Spielberger's (1996) male and female norms reveal a number of significant differences. For males, the means of the "initial" responses for both the "completed" and "uncompleted" groups, and the "as if" responses of the "completed" group are significantly higher than norms on the State Anger, Anger-In, and Anger Expression scales. The means for sober males,. listed under the "now" condition, are significantly higher on the Anger-Out scale than the established norms. For females, no significant differences were found for the "uncompleted" group, likely because of the small number of subjects (n = 5). The "completed" female group exhibited significantly higher average State Anger scores than norms in the "as if" condition. In addition, the "now" Anger Expression scores were significantly different than female norms at p = .01.

The information contained in the 44-item STAXI manual (Spielberger, 1996) suggests a specific profile for both the males and females involved in the present study. Based on mean scale values, subjects are likely to be experiencing intense anger in the intoxicated state that is directed inwards or suppressed. Males typically exhibit low scores on the STAXI Anger Control scale and consequently, would spend very little energy attempting to monitor their anger, while females have near normal levels of Anger Control (Spielberger, 1996).

When sober, male subjects appear to have near normal levels of State Anger but their elevated Anger-In and Anger Expression scores and their depressed scores on the Anger-Out and Anger Control scales reinforce their ever-present problems with anger. In effect, they are still capable of having feelings of intense anger under certain conditions.

Table 13. Male Means, Standard Deviations, Scale/Subscale Internal Consistencies, and Comparisons with Norms for the 44-Item STAXI

STAXI 44 Scale/Subscale	Norms (Spielberger,1996a)	Completed Group "Initial" n = 24	Completed Group "As If" n = 24	Completed Group "Now" n = 24	Uncompleted Group "Initial" n = 33
S-Anger (10 items)	(n = 2,880)				
M	11.29	18.17 *	20.88 *	12.67	18.30 *
SD	3.17	7.74	8.34	4.88	8.30
alpha		.903	.917	.912	.908
T-Anger (10 items)	(n = 2,880)				
M	18.65	19.63	21.63	16.92	19.88
SD	4.81	7.68	7.45	4.11	7.88
alpha		.920	.901	.764	.897
T-Anger/T (4 items)	(n = 2,880)				
M	6.24	6.79	7.29	5.25	7.36
SD	2.47	3.48	3.14	1.29	4.00
alpha		.931	.872	.661	.955
T-Anger/R (4 items)	(n = 2,880)				
M	9.34	9.29	10.33	8.83	9.00
SD	2.59	3.86	3.78	3.05	3.87
alpha		.890	.878	.766	.841
AX/In (8 items)	(n = 1,640)				
M	15.36	20.46 *	19.46 *	18.13	19.88 *
SD	3.92	5.11	4.23	5.94	5.16
alpha		.766	.623	.848	.741

Table 13 (cont'd)

STAXI 44 Scale/Subscale	Norms (Spielberger, 1996)	Completed Group "Initial" n = 24	Completed Group "As If" n = 24	Completed Group "Now" n = 24	Uncompleted Group "Initial" n = 33
AX/Out (8 items)	(n = 1,640)				
M	14.41	13.71	16.13	11.88 *	15.24
SD	3.33	4.64	5.54	3.38	4.34
alpha		.837	.893	.805	.676
AX/Con (8 items)	(n = 364)				
M	26.20	23.79	21.33 *	25.96	23.55
SD	4.26	4.95	7.14	5.51	6.73
alpha		.750	.911	.874	.882
AX/EX (24 items)	(n = 364)				
M	19.35	26.38 *	30.25 *	20.04	27.58 *
SD	7.36	9.93	12.63	11.07	12.59
alpha					

Note. M = Mean, SD = Standard Deviation, alpha = Cronbach's Alpha
* $p < .01$

Table 14. Female Means, Standard Deviations, Scale/Subscale Internal Consistencies, and Comparisons with Norms for the 44-Item STAXI

STAXI 44 Scale/Subscale	Norms (Spielberger,1996a)	Completed Group "Initial" n = 14	Completed Group "As If" n = 14	Completed Group "Now" n = 14	Uncompleted Group "Initial" n = 5
S-Anger (10 items)	(n = 1,182)				
M	12.82	20.57	22.00 *	12.64	17.20
SD	4.83	10.83	11.30	5.43	8.98
alpha		.943	.957	.945	.928
T-Anger (10 items)	(n = 1,182)				
M	19.44	21.50	21.93	16.71	22.80
SD	5.11	8.19	8.78	5.18	10.92
alpha		.876	.911	.741	.955
T-Anger/T (4 items)	(n = 1,182)				
M	6.43	8.07	7.29	5.86	8.20
SD	2.55	4.12	4.16	2.80	4.92
alpha		.935	.924	.835	.970
T-Anger/R (4 items)	(n = 1,182)				
M	9.78	9.57	10.21	8.07	10.80
SD	2.71	4.29	4.06	3.54	4.82
alpha		.836	.824	.773	.891
AX/In (8 items)	(n = 498)				
M	15.70	19.79	19.64	17.00	20.60
SD	4.24	5.81	7.23	4.91	5.73
alpha		.721	.872	.796	.659

Table 14 (cont'd)

STAXI 44 Scale/Subscale	Norms (Spielberger,1996)	Completed Group "Initial" n = 14	Completed Group "As If" n = 14	Completed Group "Now" n = 14	Uncompleted Group "Initial" n = 5
AX/Out (8 items)	(n = 498)				
M	14.92	16.00	16.07	12.57	17.40
SD	4.02	5.31	5.90	2.90	8.44
alpha		.785	.869	.521	.959
AX/Con (8 items)	(n = 274)				
M	22.06	23.29	23.43	28.57	22.20
SD	5.50	5.95	7.42	3.30	7.98
alpha		.866	.934	.685	.946
AX/EX (24 items	(n = 271)				
M	23.23	28.50	28.29	17.00 §	31.80
SD	8.84	12.90	16.78	7.79	21.52
alpha					

Note. M = Mean, SD = Standard Deviation, alpha = Cronbach's Alpha
* p<.01, § p=.01

Sober female subjects can be characterized as being very restrained, with low levels of both Anger-Out and Anger Expression and high Anger Control (Spielberger, 1996).

An additional analysis was used to determine if significant differences existed between the "initial" data sets obtained from both the completed and uncompleted groups for both genders. This took the form of an ANOVA and no significant differences were observed. The lowest *p* values for any of the 69-item STAXI scales or subscales were only found to be .206 and .487 for males and females, respectively. This finding suggests that the completed and uncompleted groups can not be distinguished by their STAXI profiles. It is, however, interesting to note that subjects in the "uncompleted" group who left the detoxification centre early did have marginally higher scores on the Anger-Out scale (p=.206) than those who remained to complete the detoxification process.

Reliability figures in the form of Cronbach's α are also presented in Tables 13 and 14. These figures are a measure of interitem consistency for each scale. No values are given under the "Norms" column or for the Anger Expression scale since scores on this scale are obtained by adding and subtracting the scores on other scales. Overall, the calculated reliabilities are very good and verify the considerable effort that went into the development of the STAXI scales.

The Phase II Statistical Analysis

The means, standard deviations, and reliability figures (Cronbach's α) for the 69-item STAXI scales and subscales appear in Tables 15 and 16 for males and females, respectively. Once again, the reliability figures are almost uniformly high with the exception of the "Feel Like Expressing Anger Physically" subscale for the "uncompleted" female group ($\alpha = .221$).

The results of the 2 x 2 x 3 (gender by age by occasion) ANOVA with repeated measures on the third factor for each of the 69-item STAXI scales and subscales are presented in Tables 17 to 27. For those instances where a significant difference among the means for the various "occasions" was found, the table includes a second panel giving the results of the multiple pairwise comparisons. In this case, the schematic representations of the differences between the various means (1 = "intoxicated", 2 = "as if", and 3 = "now") follow accepted practice (Winer, 1971). The means are always ordered from highest on the left to lowest on the right. Underlined means do not differ significantly.

Significant differences were found only for the repeated measures on "occasion" factor ("initial", "as if", or "now" conditions). No significant effects were found for age, gender, and the interactions involving age, gender, and/or occasion.

Condition effects were found for the following variables:

1. State Anger (Table 17). Subjects exhibited less State Anger when asked to describe their anger in the "now" condition than when asked to describe their anger in the "as if" condition or when asked to describe their anger when they were in the "initial" or intoxicated condition.
2. Feel Like Expressing Anger (F; Table 18). Subjects exhibited less F when asked to describe their anger in the "now" condition than when asked to describe their anger in the "as if" condition or when asked to describe their anger when they were in the "initial" or intoxicated conditions.

3. Feel Like Expressing Anger Verbally (V; Table 19). Subjects exhibited less V when asked to describe their anger in the "now" condition than when asked to describe their anger in the "as if" condition.

4. Feel Like Expressing Anger Physically (P; Table 20). Subjects exhibited less P when asked to describe their anger in the "now" condition than when asked to describe their anger in the "as if" condition.

5. Trait Anger (Table 21). Subjects exhibited less Trait Anger when asked to describe their anger in the "now" condition than when asked to describe their anger in the "as if" condition.

6. Anger-Out (Table 25). Subjects exhibited less Anger-Out when asked to describe their anger in the "now" condition than when asked to describe their anger in the "as if" condition or when asked to describe their anger when they were in the "initial" or intoxicated condition.

7. Control of Outward Anger Expression (AX/Con-Out; Table 27). Subjects exhibited less AX/Con-Out when asked to describe their anger in the "as if" condition than when asked to describe their anger in the "initial" or intoxicated condition, or when asked to describe their anger in the "now" condition.

The apparent significant results achieved in the repeated measures ANOVA for the Angry Temperament subscale (Table 22) and Anger-In scale (Table 24) are likely the result of using linear combinations of the "initial" and "as if" conditions in the analysis. No significant condition effects were found for the Angry Reaction subscale (Table 23) and the Control of Inward Anger Expression scale (Table 26).

The ANOVA results indicate that significant differences existed at the .005 level between the "initial" and "now" sets of responses for males and females together on State Anger (Table 17), "Feel Like Expressing Anger" (Table 18) , and Anger Out (Table 25). Significant differences were also indicated between the "as if" and "now" sets of responses for the State Anger (Table 17), "Feel Like Expressing Anger" (Table 18), "Feel Like Expressing Anger Verbally" (Table 19), "Feel Like Expressing Anger Physically" (Table 20), Trait Anger (Table 21), Anger Out (Table 25), and the Control of Outward Anger Expression (Table 27) scales and subscales. These significant differences represent main effects.

Notable trends in the ANOVA include the overall significantly higher scores achieved by subjects on most of the Anger scales and subscales while intoxicated. Even higher are the scores generated from their predicted responses when they are sober (the "as if" condition). Anger control improves significantly once sobriety is achieved. Lastly, Trait Anger, Angry Temperament, and Angry Reaction scale means have, surprisingly, been shown to be relatively unstable under different conditions. This actually contradicts the accepted definition of a trait. Trait-Anger, which is defined as a relatively stable and enduring aspect of personality that is designed to reveal individual differences in the propensity to experience anger, dropped considerably for all "completed" subjects between the "initial" and "now" STAXI administrations. This provides evidence to support State-Dependent learning or perhaps even the existence of an "alter-ego".

Table 15. Male Means, Standard Deviations, and Scale/Subscale Internal Consistencies for the 69-Item STAXI

STAXI 69 Scale/Subscale		Completed Group "Initial" n = 24	Completed Group "As If" n = 24	Completed Group "Now" n = 24	Uncompleted Group "Initial" n = 33
S-Anger (15 items)					
	M	25.58	29.54	18.71	26.82
	SD	10.12	11.66	6.76	12.47
	alpha	.920	.942	.931	.941
F (5 items)					
	M	11.67	12.38	7.46	11.30
	SD	4.82	4.95	3.51	4.95
	alpha	.868	.900	.910	.859
V (5 items)					
	M	8.08	10.20	6.08	8.70
	SD	4.40	4.68	2.98	5.15
	alpha	.892	.868	.923	.916
P (5 items)					
	M	5.83	6.95	5.17	6.82
	SD	1.81	3.21	.817	3.93
	alpha	.557	.894	.625	.909
T-Anger (10 items)					
	M	19.63	21.63	16.92	19.88
	SD	7.68	7.45	4.11	7.88
	alpha	.920	.901	.764	.897

Table 15 (cont'd)

STAXI 69 Scale/Subscale		Completed Group "Initial" n = 24	Completed Group "As If" n = 24	Completed Group "Now" n = 24	Uncompleted Group "Initial" n = 33
T/Anger/T (4 items)					
	M	6.79	7.29	5.25	7.36
	SD	3.48	3.14	1.29	4.00
	alpha	.931	.872	.661	.955
T/Anger/R (4 items)					
	M	9.29	10.33	8.83	9.00
	SD	3.86	3.78	3.05	3.87
	alpha	.890	.878	7.66	.841
AX/In (8 items)					
	M	20.46	19.46	18.13	19.88
	SD	5.11	4.23	5.94	5.16
	alpha	.766	.623	.848	.741
AX/Out (8 items)					
	M	13.71	16.13	11.88	15.24
	SD	4.64	5.54	3.38	4.34
	alpha	.837	.893	.805	.676

Table 15 (cont'd)

STAXI 69 Scale/Subscale		Completed Group "Initial" n = 24	Completed Group "As If" n = 24	Completed Group "Now" n = 24	Uncompleted Group "Initial" n = 33
AX/Con-In (8 items)		24.08	22.92	27.17	22.55
	M	6.65	7.33	5.09	7.34
	SD	.870	.891	.876	.882
	alpha				
AX/Con-Out (8 items					
	M	24.33	22.00	26.79	23.45
	SD	5.29	6.74	5.25	6.87
	alpha	.792	.904	.877	.880

Note. M = Mean, SD = Standard Deviation, alpha = Cronbach's Alpha

Table 16. Female Means, Standard Deviations, and Scale/Subscale Internal Consistencies for the 69-Item STAXI

STAXI 69 Scale/Subscale		Completed Group "Initial" n = 14	Completed Group "As If" n = 14	Completed Group "Now" n = 14	Uncompleted Group "Initial" n = 5
S-Anger (15 items)					
	M	30.29	32.21	18.79	24.80
	SD	15.45	16.13	7.83	12.56
	alpha	.958	.965	.949	.946
F (5 items)					
	M	12.71	13.00	7.64	11.00
	SD	6.70	6.21	4.01	5.66
	alpha	.918	.943	.929	.918
V (5 items)					
	M	10.21	11.00	6.00	8.00
	SD	6.12	6.04	3.46	6.16
	alpha	.928	.923	.968	.990
P (5 items)					
	M	7.36	8.21	5.14	5.80
	SD	4.83	5.17	.535	1.30
	alpha	.935	.936	.625	.221
T-Anger (10 items)					
	M	21.50	21.93	16.71	22.80
	SD	8.19	8.78	5.18	10.92
	alpha	.876	.911	.741	.955

Table 16 (cont'd)

STAXI 69 Scale/Subscale		Completed Group "Initial" n = 14	Completed Group "As If" n = 14	Completed Group "Now" n = 14	Uncompleted Group "Initial" n = 5
T/Anger/T (4 items)					
	M	8.07	7.29	5.86	8.20
	SD	4.12	4.16	2.80	4.92
	alpha	.935	.924	.835	.970
T/Anger/R (4 items)					
	M	9.57	10.21	8.07	10.80
	SD	4.29	4.06	3.54	4.82
	alpha	.836	.824	.773	.891
AX/In (8 items)					
	M	19.79	19.64	17.00	20.60
	SD	5.81	7.23	4.91	5.73
	alpha	.721	.872	.796	.659
AX/Out (8 items)					
	M	16.00	16.07	12.57	17.40
	SD	5.31	5.90	2.98	8.44
	alpha	.785	.869	.521	.959

Table 16 (cont'd)

STAXI 69 Scale/Subscale	Completed Group "Initial" n = 14	Completed Group "As If" n = 14	Completed Group "Now" n = 14	Uncomplete Group "Initial" n = 5
AX/Con-In (8 items)				
M	23.79	23.64	26.21	22.20
SD	5.47	6.72	5.58	8.07
alpha	.809	.892	.881	.871
AX/Con-Out (8 items				
M	22.64	22.36	25.79	21.00
SD	6.46	6.90	3.83	8.72
alpha	.879	.900	.624	.968

Note. M = Mean, SD = Standard Deviation, alpha = Cronbach's Alpha

Table 17. Results for the Univariate Analysis on the 69-Item STAXI State Anger (S-Anger) Scale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	230.05	1.065	.310
Gender	1	233.43	1.081	.306
Age Category by Gender	1	595.19	2.755	.106
Error	33	216.03		
Within Subjects Effects				
Time	2	1531.87	19.404	.000
Time by Age Category	2	74.37	.942	.395
Time by Gender	2	68.24	.864	.426
Time by Age Category by Gender	2	58.37	.739	.481
Error	66	78.95		

Panel B

Schematic Representation of Pairwise Comparisons of Means
for the 69-Item STAXI State Anger (S-Anger) Scale

$$\begin{matrix} 2 & 1 & 3 \\ \underline{31.41} & \underline{28.17} & 18.38 \end{matrix}$$

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 18. Results for the Univariate Analysis on the 69-Item STAXI "Feel Like Expressing Anger" (F) Subscale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	11.98	.284	.598
Gender	1	21.40	.507	.481
Age Category by Gender	1	124.71	2.957	.095
Error	33	42.18		
Within Subjects Effects				
Time	2	315.37	23.497	.000
Time by Age Category	2	5.34	.398	.673
Time by Gender	2	6.37	.475	.624
Time by Age Category by Gender	2	4.25	.316	.730
Error	66	42.18		

Panel B

Schematic Representation of Pairwise Comparisons of Means for the 69-Item STAXI "Feel Like Expressing Anger" (F) Subscale

2	1	3
12.86	12.35	7.29

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 19. Results for the Univariate Analysis on the 69-Item STAXI "Feel Like Expressing Anger Verbally" (V) Subscale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	36.02	1.140	.293
Gender	1	34.70	1.098	.302
Age Category by Gender	1	104.29	3.300	.078
Error	33	31.61		
Within Subjects Effects				
Time	2	202.27	13.144	.000
Time by Age Category	2	10.612	.690	.505
Time by Gender	2	12.025	.781	.462
Time by Age Category by Gender	2	6.711	.436	.648
Error	66	15.39		

Panel B

Schematic Representation of Pairwise Comparisons of Means for the 69-Item STAXI "Feel Like Expressing Anger Verbally" (V) Subscale

2	1	3
10.77	9.22	5.94

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 20. Results for the Univariate Analysis on the 69-Item STAXI "Feel Like Expressing Anger Physically" (P) Subscale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	32.54	2.094	.157
Gender	1	22.67	1.458	.236
Age Category by Gender	1	9.101	.586	.450
Error	33	15.54		
Within Subjects Effects				
Time	2	57.81	10.318	.000
Time by Age Category	2	10.62	1.895	.158
Time by Gender	2	5.74	1.025	.364
Time by Age Category by Gender	2	16.52	2.949	.059
Error	66	5.60		

Panel B

Schematic Representation of Pairwise Comparisons of Means
for the 69-Item STAXI "Feel Like Expressing Anger Physically" (P) Subscale

2	1	3
7.77	6.61	5.14

Note: Underlined means are not significantly different
1 = "initlal"
2 = "as if"
3 = "now"

Table 21. Results for the Univariate Analysis on the 69-Item STAXI Trait-Anger (T-Anger) Scale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	9.59	.088	.768
Gender	1	32.54	.300	.587
Age Category by Gender	1	57.27	.528	.472
Error	33	108.42		
Within Subjects Effects				
Time	2	210.66	10.288	.000
Time by Age Category	2	18.56	.906	.409
Time by Gender	2	4.81	.235	.791
Time by Age Category by Gender	2	36.23	1.769	.178
Error	66	20.48		

P[illegible]l B

Schematic Representation of Pairwise Comparisons of Means for the 69-Item STAXI Trait-Anger (T-Anger) Scale

2	1	3
21.90	20.69	17.07

Note. Underlined items are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 22. Results for the Univariate Analysis on the 69-Item STAXI Angry Temperament (T-Ang/T) Subscale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	2.62	.119	.732
Gender	1	15.03	.686	.414
Age Category by Gender	1	7.10	.324	.573
Error	33	21.93		
Within Subjects Effects				
Time	2	35.63	7.143	.002
Time by Age Category	2	5.14	1.031	.362
Time by Gender	2	1.95	.392	.678
Time by Age Category by Gender	2	2.70	.540	.585
Error	66	4.99		

Panel B

Schematic Representation of Pairwise Comparisons of Means for the 69-Item STAXI Angry Temperament (T-Ang/T) Subscale

1	2	3
7.49	7.41	5.66

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 23. Results for the Univariate Analysis on the 69-Item STAXI Angry Reaction (T-Ang/R) Subscale

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	5.62	.180	.674
Gender	1	.23	.008	.931
Age Category by Gender	1	72.78	2.335	.136
Error	33	31.18		
Within Subjects Effects				
Time	2	23.73	4.913	.010
Time by Age Category	2	5.71	1.182	.313
Time by Gender	2	1.56	.323	.725
Time by Age Category by Gender	2	12.20	2.525	.088
Error	66	4.83		

Table 24. Results for the Univariate Analysis on the 69-Item STAXI Anger-In (AX/In) Scale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	3.14	.046	.832
Gender	1	1.12	.016	.899
Age Category by Gender	1	8.77	.128	.723
Error	33	68.62		
Within Subjects Effects				
Time	2	83.68	7.602	.001
Time by Age Category	2	13.90	1.263	.290
Time by Gender	2	11.87	1.078	.346
Time by Age Category by Gender	2	6.80	.618	.542
Error	66	11.01		

Panel B

Schematic Representation of Pairwise Comparisons of Means for the 69-Item STAXI Anger-In (AX/In) Scale

1	2	3
20.47	19.98	17.51

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 25. Results for the Univariate Analysis on the 69-Item STAXI Anger-Out (AX/Out) Scale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	22.11	.430	.517
Gender	1	15.84	.308	.583
Age Category by Gender	1	.49	.009	.923
Error	33	51.46		
Within Subjects Effects				
Time	2	136.89	14.129	.000
Time by Age Category	2	2.37	.245	.784
Time by Gender	2	8.56	.884	.418
Time by Age Category by Gender	2	7.51	.775	.465
Error	66	9.69		

Panel B

Schematic Representation of Pairwise Comparisons of Means for the 69-Item STAXI Anger-Out (AX/Out) Scale

$$\begin{array}{ccc} 2 & 1 & 3 \\ \multicolumn{2}{c}{\underline{16.17 \qquad 14.83}} & 12.18 \end{array}$$

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Table 26. Results for the Univariate Analysis on the 69-Item STAXI Control of Inward Anger Expression (AX/Con-In) Scale

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	101.79	1.309	.261
Gender	1	21.33	.274	.604
Age Category by Gender	1	4.01	.052	.822
Error	33	77.78		
Within Subjects Effects				
Time	2	117.17	5.852	.005
Time by Age Category	2	40.39	2.017	.141
Time by Gender	2	3.90	.195	.824
Time by Age Category by Gender	2	8.04	.402	.671
Error	66	20.02		

Table 27. Results for the Univariate Analysis on the 69-Item STAXI Control of Outward Anger Expression (AX/Con-Out) Scale

Panel A

Source	df	Mean Square	F	Sig.
Between Subjects Effects				
Age Category	1	8.40	.120	.731
Gender	1	25.39	.364	.550
Age Category by Gender	1	90.45	1.297	.263
Error	33	69.72		
Within Subjects Effects				
Time	2	222.96	12.466	.000
Time by Age Category	2	27.68	1.548	.220
Time by Gender	2	15.59	.872	.423
Time by Age Category by Gender	2	14.08	.787	.459
Error	66	17.89		

Panel B

Schematic Representation of Pairwise Comparisons of Means
for the 69-Item STAXI Control of Outward Anger Expression (AX/Con-Out) Scale

3	1	2
26.33	23.33	22.15

Note. Underlined means are not significantly different
1 = "initial"
2 = "as if"
3 = "now"

Chapter V: Summary, Limitations, and Directions for Future Research

Introduction

This chapter summarizes the results obtained from the present study, "Anger and Anger Control Among Recovering Alcoholics". The relationships between the study's results, and its stated objectives and hypotheses are examined. In addition, considerable attention is given to the possible major limitations of the study (Table 30). Each limitation is discussed and evaluated with respect to how it might be minimized or prevented in a future study. Literature relevant to the limitations is reviewed and a proposal for a new, improved study is presented based on this critical evaluation.

Summary of Results

Returning to the null-hypotheses that were presented in Chapter I, the results of this study allow for the following:

(1) Rejection of the null-hypothesis which states that there are no differences in anger between intoxicated subjects and "normal" individuals for the State Anger, Anger-In, and Anger Expression scales of the 44-item STAXI for males. The null-hypothesis specifying no differences is accepted for the Trait Anger, Angry Temperament, Angry Reaction, Anger-Out, and Anger Control scales for both sexes and for the State Anger, Anger-In, and Anger Expression scale for females.

(2) Failure to reject the null-hypothesis which states that there are no differences in anger, as measured by any of the STAXI ETF scales,

between the subjects' intoxicated responses and their sober estimates of these responses.

(3) Rejection of the null-hypothesis which states that there are no differences in anger, as measured by State Anger, Feeling Angry, and Anger-Out between the responses given while intoxicated and those given while sober. This null-hypothesis is accepted for the "Feel Like Expressing Anger Verbally", "Feel Like Expressing Anger Physically", Trait Anger, Angry Temperament, Angry Reaction, Anger-In, Anger Control-In, and Anger Control-Out scales.

(4) Failure to reject the null-hypothesis that states there are no gender or age differences in 2 or 3 above.

Differences between norms and the means obtained by intoxicated subjects on certain 44-item STAXI scales and subscales are apparent (1. above). The results of this study (3. above) indicate that many aspects of anger exhibit changes that have moderate to large effect sizes between the intoxicated and sober states. Sober subjects are also able to predict their intoxicated levels of anger with considerable accuracy (2. above). The reasons for these results remain elusive. If Trait Anger had changed significantly between the intoxicated ("initial") and sober ("now") responses, pharmacological mechanisms could have explained the difference. The fact that sober subjects are able to closely predict their intoxicated responses is consistent with expectation or the social thesis of "Drunken Comportment" outlined by MacAndrew and Edgerton (1969). Here, drunken comportment is merely a reflection of what a particular society will permit and our society permits displays of anger from intoxicated individuals (MacAndrew & Edgerton, 1969). Kai Pernanen's comments at the end of his book "Alcohol in Human Violence" (1991) are equally appropriate here:

> If we pool the present knowledge available from different disciplines, there is convincing evidence of the crucial part played by alcohol's effects, by situational contingencies, and by social and sociocultural factors at several different junctures . . . (p. 217)

Present Results and Previous Research

A considerable amount of literature deals with the effects of alcohol on both emotions and behaviour. The following general "themes" are evident:

(1) That alcoholics can often be grouped according to personality types derived from MMPI or MCMI profiles (Graham & Strenger, 1988).

(2) That individuals who have consumed alcohol, alcoholics, and Adult Children of Alcoholics (ACOA's) appear to have elevated scores on self-report anger inventories (Warren & Raynes, 1972; Potter-Efron & Potter-Efron, 1991; Tivis, Parsons, & Nixon, 1998).

(3) That individuals under the influence of alcohol are often more aggressive or violent than individuals who are sober (Bushman & Cooper, 1990).

(4) That various hypotheses are offered in order to explain the changes in behaviour associated with alcohol consumption. These may emphasize the contribution of pharmacological, sociological, psychological or situational factors (Pernanen, 1976; 1991).

(5) That rare cases of alcohol-related violence may be due to a phenomena referred to as "drug-induced automatism" (Wilkinson, 1997).

(6) That alcohol can have various effects, including stress-reduction, under specific conditions (Roizen, 1983).

The nature of the present study and the obtained results allow comments and conclusions regarding some of these "themes".

Previous studies that have used the 44-item STAXI with alcoholics, alcoholics in recovery, or ACOA's (e.g., Potter-Efron & Potter-Efron, 1991; Tivis, Parsons, & Nixon, 1998) have consistently reported high anger scores on some STAXI scales. However, the results vary from study to study. Two-tailed, two sample *t*-tests at the .05 level of significance were used to compare the means reported by other researchers with corresponding means in the present study. The results for the specified 44-item STAXI scales are given in Tables 28 and 29 for males and females, respectively.

The means found by Walfish, Massey, and Krone (1990), and Tivris, Parsons, and Nixon (1998), which used the 44-item STAXI with alcoholics in treatment, have yielded scale means that are significantly different from those found in the present study (see Tables 28 and 29). This is also the case with the Potter-Efron and Potter-Efron (1991) investigation (see detailed results in Chapter II). It should be noted that the sober responses of the subjects in the present study (referred to as the "now" condition) are used for comparison purposes in order to provide conditions that are somewhat similar to those for patients in inpatient treatment who have been sober for a minimum length of time of several weeks. The studies mentioned found significantly higher Trait Anger and Anger-Out scores and lower State Anger scores than those calculated for the present study.

Consideration needs to be given to the specified or implied population that a particular study is sampling. This is a critical factor in the generalizability of results. Walfish, Massey, and Krone (1990) refer to anger among "abusers of different substances", go on to sample alcoholics and other substance abusers in inpatient treatment, and state that their findings apply only to those in inpatient treatment. Clearly, their intended population is alcoholics (and others) in inpatient treatment. Potter-Efron and Potter-Efron (1991) state that "the study of anger is relevant to a population affected by alcoholism" (p.38) and make conclusions about this rather large and diverse group after sampling alcoholics and others involved in various treatment programs. Tivis, Parsons, and Nixon (1998) use an "inpatient treatment sample of chronic alcoholics" but also mention investigating the "role of anger in alcohol abuse and alcoholism" (p.906). This suggests that their population of interest is "alcoholics". In the present study, the population is alcoholics in recovery but the group being sampled includes only those who enter a treatment facility for alcohol detoxification in an intoxicated state. Therefore, direct comparisons between the results obtained in these studies may not be appropriate.

An examination of the samples used in each of these studies is in order. Walfish, Massey, and Krone (1990) report only a Trait Anger score for a combination of 222 males and 78 females "presenting themselves for treatment" at a "for profits, intensive residential treatment center" (p. 254). Potter-Efron and Potter-Efron (1991) describe their subjects as follows:

Table 28. Comparisons of Male 44-Item STAXI Results with Other Studies

STAXI Scale		Walfish, Massey, & Krone (1990) *n* = 300*	Tivis, Parsons, & Nixon (1998) *n* = 70	Williamson (present study) *n* = 24
S-Anger				
	M		10.84[a]	12.67[a]
	SD		2.20	4.88
T-Anger				
	M	21.59[c,d]	19.26[b,c]	16.92[b,d]
	SD	5.66	4.83	4.11
AX/IN				
	M		18.38	18.13
	SD		4.60	5.94
AX/Out				
	M		15.57[e]	11.88[e]
	SD		3.89	3.38

Note. M = Mean, SD = Standard Deviation
* Subjects consisted of males and females.
Figures that share superscripts are significantly different at the .05 level of significance.

Table 29. Comparisons of Female 44-Item STAXI Results with Other Studies

STAXI Scale		Walfish, Massey, & Krone (1990) *n* = 300*	Tivis, Parsons, & Nixon (1998) *n* = 34	Williamson (present study) *n* = 14
S-Anger				
	M		10.32[a]	12.64[a]
	SD		1.25	5.43
T-Anger				
	M	21.59[b,c]	17.85[b]	16.71[c]
	SD	5.66	4.20	5.18
AX/In				
	M		17.91	17.00
	SD		5.35	4.91
AX/Out				
	M		15.45[d]	12.57[d]
	SD		3.42	2.98

Note. M = Mean, SD = Standard Deviation
* Subjects consisted of males and females.
Figures that share superscripts are significantly different at the .05 level of significance.

> Subjects were selected by using available populations in seven treatment settings in the state of Wisconsin. Settings included one hospital-based treatment center; two county alcohol and drug information, referral, and treatment organizations; one half-way house; two private nonprofit clinics; one county guidance clinic; and one private for-profit clinic. Participants were mixed urban and rural, overwhelmingly Caucasian, and of mixed economic levels. Willing members of these groups were asked to complete the STAXI and to provide appropriate demographic information. Confidentiality of responses was preserved. A total of 141 scorable questionnaires were returned and analyzed. Forty point four percent (57) of these were from individuals being treated in an inpatient setting for alcoholism. Forty-four point seven percent (63) were receiving outpatient alcohol treatment, and 14.9% (21) were receiving outpatient treatment specifically as adult children of alcoholics. Sixty-two point four percent were male, 37.6% female. (p. 34)

The heterogeneous nature of this sample, and the fact that the duration of treatment is not specified, make comparisons difficult. Tivris, Parsons, and Nixon (1998) used 70 male and 34 female alcoholics who were sober between 21 and 45 days and were "recruited from private and state-operated chemical-depending treatment centers in the Oklahoma City area" (p. 903).

Clearly, many differences exist in the samples used in the above studies. What is immediately obvious is the fact that the Potter-Efron and Potter-Efron (1991) study included ACOA's as well as alcoholics in both inpatient and outpatient settings. As well, it would appear that, for different studies, the length of time in treatment could vary from a few days (Potter-Efron & Potter-Efron, 1991) to as many as 45 days (Walfish, Massey, & Krone, 1990).

For-profit facilities are used to some extent in the Potter-Efron and Potter-Efron (1991) and the Tivis, Parsons, and Nixon (1998) studies while the Walfish, Massey, and Krone (1990) study used a private "for profits" (p. 254) residential treatment center exclusively.

For-profit treatment facilities probably cater to a different type of individual than those that are publicly-funded. For example, the Betty Ford Center in the Los Angeles area charges $14,400 U.S. for a 28-day inpatient program (Betty Ford Center, 2000). Its list of alumni members includes many celebrities and professionals. On the opposite end of the spectrum, an inner-city non-profit treatment center run by a church deals with considerably poorer people who may only want to "sleep it off" (George Spady Centre, 2000). As in all areas of health care, especially in the United States, the available treatments can be two-tier (Gordhandas, 1997). These distinctions lead to other conclusions regarding the populations served by different types of facilities. Alcoholics who must pay for their own treatment, or are covered by private insurance, are more likely to have high-paying jobs, be better educated, and be more intelligent than those who end up in publicly-funded programs. Studies have shown that intelligence (Edwards

& Rollnick, 1997), cognitive functioning and self-efficacy (Allsop, Saunders, & Phillips, 2000) are good predictors of treatment success.

This hypothesized split in populations served between public and private centres could account for the significantly higher Trait Anger and Anger-Out scores among studies using only private alcohol rehabilitation centers or a combination of private and public centers. Simply stated, persons who are not worrying about their next meal, paying the rent, or having a job may be more lively and outgoing (i.e. less depressed).

For the sake of convenience, study samples may overrepresent certain subtypes of alcoholics. Major personality disorders identified using DSM-III (1980) and DSM-IV (1994) criteria and shown by research to be prevalent among alcoholics include Borderline Personality Disorder, Dependent Personality Disorder, Antisocial Personality Disorder, and Paranoid Personality Disorder (Marchiori, Loschi, Marconi, Mioni, & Pavan, 1999; Windle, 1999; Horvath & Jonsdottir-Baldursson, 1990; Poldrugo & Forti, 1988). As discussed previously, the sample in the present study may contain a large number of individuals who might be characterized as passive-aggressive. The essential characteristic here is a resistance (expressed indirectly) to demands for adequate performance or behaviour (DSM-IV-TR, 2000).

In the case of those subjects admitted to the detoxification centre in this study, expected behaviors included many hours without a drink and the onset of withdrawal. Those subjects interviewed obviously had not abstained for this length of time and were not experiencing withdrawal. Consequently, subjects may have demonstrated less Trait Anger and Anger-Out due to their passive-aggressive style (see discussion, p. 125).

Other studies, which include data gathered wholly or partially at private clinics, may reflect the responses given by samples with higher socio-economic status and higher intelligence. Indeed, Taub (1996) found that a diagnosis of Borderline Personality Disorder was more likely among people of upper social classes and those with advanced education. As a result, the STAXI means on scales such as Trait Anger may rise due to a higher frequency of subjects with Borderline Personality Disorder who tend to have inappropriate intense anger.

Variations in State Anger were also found between studies. Results from Tivis, Parsons, and Nixon (1998) show significantly lower levels of anger for both males and females than the present study. State Anger reflects anger associated with an individual's immediate situation and surroundings. For inpatient treatment, it can be assumed that State Anger, at least in part, is a measure of comfort levels and interactions with both staff and other "alcoholics" in the facility. Therefore, variations in State Anger are to be expected between studies. The initial high levels of State Anger for subjects in the present study may partially reflect individual reasons for entering detoxification and the intensity of the situation encountered prior to their first interview. For example, some subjects may have been forced into detoxification by their employers against their wishes. At the other extreme, a small number may have seen the recovery centre as an inexpensive source of food and shelter for several days. In the first instance, State Anger may be high while, in the second, the individuals involved may have been relieved to have been admitted.

Subjects involved in the identified studies varied with respect to length of time in treatment. Relapse rates for alcoholics are especially high over the first eight to ten weeks of treatment after detoxification (Sass, Soyka, Mann, & Zieglgansberger, 1996). After 12 weeks, only 50 percent remain sober. There may be a greater tendency for people with Antisocial or Paranoid Personality Disorders to relapse early, due to their inability to establish and maintain positive relationships with others, thus affecting the average responses on the STAXI given by samples that have been sober longer. Individuals who tend to remain in treatment the longest may be those diagnosed with Dependent Personality Disorder (Poldrugo & Forti, 1988).

On many 69-item STAXI scales and subscales, subjects tended to overestimate their intoxicated anger levels when sober (i.e., see Tables 17 to 27). This finding is consistent with the type of "memory bias" reported by Cowan (1983) and mentioned in Chapter II.

Established criteria for the identification of specific personality disorders can be found in both the American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; 2000) and the World Health Organization: ICD-10 Classification of Mental and Behavioral Disorders (ICD-10; 1993). Table 30 reproduces the characteristics found in individuals diagnosed with Borderline Personality Disorder, which is typically found in 30% to 60% of a given clinical population (DSM-IV-TR, 2000) and is often associated with substance abuse problems. Antisocial Personality Disorder, like Borderline Personality Disorder, is common among alcoholics and drug abusers and can account for up to 30% of those

Table 30. Diagnostic Criteria for 301.83 Borderline Personality Disorder

A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the following:

(1) frantic efforts to avoid real or imagined abandonment. Note: do not include suicidal or self-mutilating behavior covered in Criterion 5.
(2) a pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation
(3) identify disturbance: markedly and persistenty unstable self-image or sense of self
(4) impulsivity in at least two areas that are potentially self-damaging (e.g., spending, sex, substance abuse, reckless driving, binge eating). Note: Do not include suicidal or self-mutilating behavior covered in criterion 5.
(5) recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior
(6) affective instability due to a marked reactivity of mood (e.g., intense episodic dysphoria, irritability, or anxiety usually lasting a few hours and only rarely more than a few days)
(7) chronic feelings of emptiness
(8) inappropriate, intense anger or difficulty controlling anger (e.g., frequent displays of temper, constant anger, recurrent physical fights)
(9) transient, stress-related paranoid ideation or severe dissociative symptoms

(DSM-IV-TR, 2000, p. 710)

diagnosed with a personality disorder in clinical settings (DSM-IV-TR, 2000). The criteria for a diagnosis of Antisocial Personality Disorder can be found in Table 31. In the comments found in Chapter IV regarding the data collection interviews, it is suggested that the subjects in the present study may represent a "Passive-Aggressive" subgroup of all alcoholics who enter detoxification. A Passive-Aggressive Personality Disorder was identified in the American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III; 1980), the subsequent revision (DSM-IIIR; 1987), and the ICD-10 (1993). In the American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; 1994) this category was removed from the section on personality disorders and placed in the appendix because questions were raised as to whether or not this was a disorder or merely a behavior

Table 31. Diagnostic Criteria for 301.7 Antisocial Personality Disorder

A. There is a pervasive pattern of disregard for and violation of the rights of others occurring since age 15 years, as indicated by three (or more) of the following:

  (1) failure to conform to social norms with respect to lawful behaviors as indicated by repeatedly performing acts that are grounds for arrest
  (2) deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure
  (3) impulsivity or failure to plan ahead
  (4) irritability and aggressiveness, as indicated by repeated physical fights or assaults
  (5) reckless disregard for safety of self or others
  (6) consistent irresponsibility, as indicated by repeated failure to sustain consistent work behavior or honor financial obligations
  (7) lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another

B. The individual is at least age 18 years.

C. There is evidence of Conduct disorder with onset before age 15 years.

D. The occurrence of antisocial behavior is not exclusively during the course of Schizophrenia or a Manic Episode.

(DSM-IV-TR, 2000, p. 706)

pattern. Accordingly, Passive-Aggressive (Negativistic) Personality Disorder has been set apart from the other personality disorders and research criteria have been established so that the usefulness of this category can be assessed. The ICD-10 (1993) classification of Passive-Aggressive (Negativistic) Personality Disorder continues to be used. The DSM-IV-TR research criteria for this "disorder" are shown in Table 32.

Other personality disorders that may appear in alcoholics include Dependent Personality Disorder and Paranoid Personality Disorder. DSM-IV briefly describes those individuals diagnosed with Dependent Personality Disorder as having "a pervasive and excessive need to be taken care of that leads to submissive and clinging behavior and fears of separation" (p. 284). Similarly, Paranoid Personality Disorder manifests itself as "a pervasive distrust and suspiciousness of others such that their motives are interpreted as

Table 32. Research Criteria for Passive-Aggressive Personality Disorder

A. A pervasive pattern of negativistic attitudes and passive resistance to demands for adequate performance, beginning by early adulthood and present in a variety of contexts, as indicated by four (or more) of the following:

(1) passively resists fulfilling routine social and occupational tasks
(2) complains of being misunderstood and unappreciated by others
(3) is sullen and argumentative
(4) unreasonably criticizes and scorns authority
(5) expresses envy and resentment toward those apparently more fortunate
(6) voices exaggerated and persistent complaints of personal misfortune
(7) alternates between hostile defiance and contrition

B. Does not occur exclusively during Major Depressive Episodes and is not better accounted for by Dysthymic Disorder.

(DSM-IV-TR, 2000, p. 791)

malevolent, beginning by early adulthood and present in a variety of contexts" (p. 276). Although the overall rates of occurrence for these disorders in clinical populations are likely to be much lower than for Borderline or Antisocial Personality Disorder, some individuals are likely to be diagnosed as having both Borderline and Paranoid Personality Disorders. Borderline and Antisocial Personality Disorders also coexist in many individuals (Widiger *et.al.*, 2000).

Speculation concerning the potential effects of personality on the data obtained in the present study, and the results of previous research, is justified. In the data collection interviews, this researcher was aware of a large number of behaviors associated with the above diagnoses (i.e. impulsivity, recklessness, irresponsibility, paranoid ideation, etc.).

Limitations

Several limitations (Table 33) were identified which may have influenced the results obtained in the present study. These are discussed.

Table 33. Possible Limitations of the Present Study

- Inadequate Sample Size
- Use of a "Convenience" Sample
- Limited Collection of Demographic Data
- High Attrition Rate
- Lack of "Objective" Measures of Intoxication
- Lack of Data Concerning Subjects' Personalities
- Practice Effects Related to the STAXI Administrations
- Unavailability of Appropriate Canadian STAXI Norms
- Psychometric Properties of the STAXI

Inadequate Sample Size

A review of basic statistics shows that the sample size, in combination with the effect size and the level of significance, determine whether or not significant differences between means are found (assuming that a difference does exist). A small sample may lead to Type 2 error (i.e. the incorrect acceptance of the null hypothesis). Although formulas exist for the required number of subjects needed for a particular study, they require an estimate of the effect sizes (see McCall, 1982). These were unknown quantities for the many variables used in the present study (e.g., the various 69-item STAXI scales and subscales).

Similar studies of anger in alcoholics have used larger samples. Walfish, Massey, & Krone (1990) used 300 subjects, but failed to give any breakdown by gender. Potter-Efron and Potter-Efron (1991) used 88 males and 53 females while Tivis, Parsons, and Nixon's (1998) study involved 70 males and 34 females.

Of course, when a study is under way, at any point a statistical analysis can be performed on the data collected in order to ascertain whether or not the sample size is large enough to achieve significance for a particular effect size, if it is suspected that real differences in means exist. This researcher believes that a "completed" sample of 50 males and 50 females would be desirable for a study of this type. This conclusion is based on a number of factors. From the results of the ANOVA completed in the Phase II data analysis, it is known that many more 69-item STAXI scales and subscales could exhibit a main effect for "condition" ("initial", "as if", or "now") if the study sample size had been larger. Greater numbers of subjects lead to more degrees of freedom in the determination of the critical value of F (the test statistic used in the ANOVA). An examination of the calculated values of F for each of the STAXI scales and subscales that did not exhibit a main effect for "condition", and the associated values of F for a sample of 50, reveals that most of these additional scales and subscales would have a main effect for condition under these conditions. Significant gender differences might also become apparent because SPSS has combined the male and female results in the present analysis. This is a consequence of the low overall sample size (especially for females).

Use of a "Convenience" Sample

In order to ensure that the results of a particular study are truly representative of the population being sampled, random sampling methods must be employed. The population of interest in the present study is "alcoholics" in recovery (detoxification). In the present study, random sampling of all "alcoholics" entering detoxification was not attempted and only "alcoholics" who entered detoxification in an intoxicated state were used as subjects. Stratified random sampling within this select group would have been possible but would have required greater numbers of subjects and, therefore, more time than was practical, or available, to complete.

In recruiting subjects, the researcher was dependent on AADAC staff who were asked to identify any individuals who met the criteria for inclusion in the study and to notify the researcher. Some staff members were more vigilant and attentive than others in accomplishing this task. One possible remedy for this would have been to offer monetary compensation in return for referrals although the ethics of this strategy, as well as AADAC policy, would need to be taken into consideration, and might preclude the use of this recruiting "incentive". The vast majority of those who enter the detoxification centre are already experiencing "withdrawal" or are abusing other drugs. The 76 "alcoholics" who completed at least the "initial" STAXI administration for the researcher were referred by AADAC staff over a period of 20 months. This gives some indication of the difficulty involved obtaining suitable subjects. An analysis using t-tests showed no statistically significant differences between the "completed" and "uncompleted" groups on any of the STAXI scales or subscales for either gender. This finding increases the probability that the sample used is truly representative of all intoxicated "alcoholics" who enter detoxification, especially so for males, who make up 75% of the combined sample.

One method that could have been used to check for similarities or differences between the subjects used in the present study and the remaining "alcoholics" entering detoxification would have been to sample "alcoholics" who were not intoxicated at the time of entry. Comparisons between means obtained on the STAXI scales and subscales would have yielded any statistically significant differences, or, alternatively, the acceptance of the null hypothesis. This would be appropriate because the target population for the present study was "alcoholics" in recovery.

Limited Collection of Demographic Data

Age and gender were the only demographic variables incorporated into the present study in accordance with the stated objectives. No significant main effects or interactions were found for either age or gender (see Tables 17 to 27). However, this may not have been the case if a larger sample (especially in the case of females) had been obtained.

Additional data that might provide even more insight into the anger in recovering alcoholics include marital status, race, socio-economic status, number of years of education, employment history, drinking history, reasons for admission to detoxification, and the total number of admissions to detoxification. Some studies have even suggested that the day of the week of admission is a significant factor in attrition rate (Armenian, Chutuape, & Stitzer, 1999). Building on this, the length of time from the last paycheck might also be a variable of interest because having enough money to purchase quantities of alcohol is undoubtedly a factor in continued consumption.

In their study on anger in alcoholics receiving inpatient treatment, Tivis, Parsons, & Nixon (1998) include several demographic variables in their analysis, as well as the State Trait Anxiety Inventory (STAI; Spielberger, 1983), the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988), the Shipley Institute of Living Vocabulary and Abstraction Scales (Zachary, 1986), and, of course, the 44-item STAXI. The demographic variables were: age, gender, level of education, consequences of drinking, and details of the subject's previous drinking behavior reflected in a Quantity-Frequency

Index, a Typical Quantity Index, a Typical Frequency Index, a Maximum Quantity Index, and a Maximum Frequency Index.

Results of the Tivis, Parsons, and Nixon study (1998) indicate that the demographic variables were significant in a number of ways. A positive correlation between State Anger and level of education for females only was found. In males, Anger-In was negatively correlated with the Quantity-Frequency Index, i.e. Anger-In decreased as the average daily intake of alcohol increased. In females, State-Anger was positively correlated with Typical Quantity. And lastly, Anger-In was positively correlated with the consequences of drinking measure for females. No main effects for either age or gender were found. The relationships between means on the various inventories used in this study (STAI, STAXI, and BDI) are discussed elsewhere (see "Lack of Data Concerning Subjects' Personalities").

High Attrition Rate

If all of the subjects initially interviewed had remained to complete the three 69-item STAXI administrations, the sample would have been comprised of 76 rather than 38 subjects. Of the 57 males initially interviewed in the study, 33 left detoxification prematurely and together comprised the "uncompleted" male group while the remaining 24 males formed the "completed" group. The corresponding figures for the female groups were five "uncompleted" and 14 "completed". Clearly, the percentage of females who left early (36%) was much lower than for males (58%), however, a z-test for proportion indicates that this difference is not statistically significant at the 5% level.

Skaff, Finney, and Moos (1999) explored the relationship between stressors and resources in a group of 515 male and female alcoholics and concluded that the most striking difference between males and females was the much stronger impact of friendships observed among women. This leads to the speculation that the ability to establish relationships may be a critical factor in detoxification and recovery, and may be more difficult for males - especially in groups where Antisocial Personality Disorders are common. Other factors that may predict attrition include depression (O'Leary, Rohsenow, & Chaney, 1979) and less education (Epstein, McCrady, Miller, & Steinberg, 1994).

The attrition rates for those who enter the AADAC detoxification centre, while intoxicated, seem high. Discussions with the director of the centre, Evelina Kohlman (personal communication, September 22, 2000), have indicated that the overall rates of attrition for this facility were 33% for males and 38% for females in 1996. The highest rates for a specific type of abusable substance are around 50% for benzodiazepines. It is interesting to note that after the detoxification unit moved[4] from its older, rather cramped, facility to a more spacious and brighter location, the attrition rates have dropped to levels in the 25% to 30% range. Acts of aggression have also decreased. The level of 50% achieved in the present study can be explained by the fact that intoxicated individuals may be more easily persuaded to seek help by a boss, a spouse, or a friend than when sober. Within hours or a few days of admission they may more easily fall back into their established patterns than subjects who made something closer to an independent decision to change. Baer, Holt, and Lichtenstein (1986) have suggested that self-efficacy is the best predictor of relapse once treatment has begun. And self-efficacy is something that "alcoholics" who were seemingly coerced into recovery are lacking.

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[4] This move occurred after the data used in the present study were collected.

Although information regarding the overall attrition rates of recovering alcoholics over the first year after detoxification is available (see Sass *et.al.*, 1996), the corresponding figures for detoxification units are difficult to find (many centers do not compile attrition statistics). One possible reason for this apparent lack of record keeping is that high attrition figures may be taken by some individuals as an indication of ineffective treatment or a poorly-managed treatment center, even if this is not the case.

Lack of Objective Measures of Intoxication

In the present study, "intoxicated" subjects were defined as individuals who had consumed alcohol within eight hours prior to being interviewed in the "initial" condition and who had not experienced "withdrawal". Using these criteria, considerable variations would be expected in BAC's between participants. Is BAC closely related to anger levels and should measurements of BAC levels have been undertaken, using, for example, a Breathalyzer, to ensure consistency?

Studies undertaken in controlled conditions where subjects are given alcohol often involve the assessment of feelings or behaviors at a given BAC. Warren and Raynes (1972) study of mood changes in college students is a good example. However, without this degree of experimental control, uniform concentrations are almost impossible to achieve. If BAC's had been taken in the present study, it is expected that the results would have been wide-ranging. It is also possible that a few subjects would have been caught on the ascending portion of the BAC curve prior to the onset of CNS depression.

Giancola and Zeichner (1997) investigated the biphasic effects of alcohol on aggression. The term "biphasic" is used to distinguish between an ascending BAC, which is associated with an increase in arousal and neuropsychological deficits, or a descending BAC, which produces sedation, depression and a dysphoric mood. In their study, Giancola and Zeichner measured BAC's in 30 male social drinkers who had consumed alcohol, and tested them using a modified Taylor aggression paradigm which involved administering electric shocks to a "fictitious" opponent during a competitive task. Levels of aggression were based on the intensity and duration of the shock, and assessments were made at a BAC of 0.08% on either the ascending or descending limb. An additional 30 subjects served as controls. The results indicate that mean shock intensities selected by intoxicated subjects were significantly greater on the ascending BAC limb than those chosen by sober controls. Mean shock intensities chosen by intoxicated subjects with a descending BAC were essentially the same as those selected by the control group. Giancola and Zeichner concluded that aggression is only a problem with ascending BAC's.

These findings may have implications for the present study. It is likely that very few, if any, of the "intoxicated" subjects would have had ascending BAC's. Their BAC's would have been different but were probably all descending. This conclusion is arrived at in the following way. Subjects included in the present study were required to have had a drink within the last eight hours. By the time the researcher interviewed the subjects, a minimum of two to three hours had elapsed from the time of their last drink. Subjects were also questioned as to what alcohol they had consumed. Alcohol is metabolized at an average rate of 7 to 10 grams per hour in adults (roughly equivalent to one drink) (Stimmel, 1991). Tolerance may increase this rate. Therefore, if study subjects were to have had an ascending BAC at the time of the first interview, they would have needed to consume a large quantity of alcohol immediately prior to being admitted to the detoxification centre. Based on the subjects' own description of their behavior, this was not the case. Subjects interviewed six to eight hours after their last drink would have the highest probability of a descending BAC. This leads to two possible conclusions. Firstly, that the pharmacological effects of alcohol on anger, which may be seen as a precursor to aggression, may have been uniform for all "intoxicated" subjects. And, secondly, that these pharmacologic effects may not exist, at this point. In this case, other non-pharmacological explanations, such as those based on expectations or socially-sanctioned behaviors begin to look attractive. In addition, it may be that a rising BAC produces CNS depression, a corresponding decrease in social inhibitions and, thereby, facilitates an increase in anger. Conversely, a falling BAC reduces CNS depression and ultimately leads to a decrease in anger.

Due to tolerance in heavy drinkers (the need for increasing amounts of alcohol to achieve a given effect) (DSM-IV-TR, 2000), it would seem that BAC's would provide only a very crude assessment of alcohol as a factor in either feelings or behaviors (Hiltunen, 1997). Some of the subjects in this study drove their vehicles to the detoxification centre while intoxicated. Although, as a rule, they were reprimanded by the AADAC staff for doing so, there was no police involvement. In a situation such as this, use of a Breathalyzer to ascertain BAC levels could have introduced elements of suspicion and fear. As a consequence, the low number of participants may have been reduced even more.

Lack of Data Concerning Subjects' Personalities

Personality differences among subjects have been discussed as they relate to the present study. Furthermore, the quantity of research done using personality inventories, such as the MMPI or MCMI, serves as an indication of the importance of the concept of personality types as it relates to alcoholics (Graham & Strenger, 1988). More recently, the use of DSM criteria has all but superseded the older "labels" placed on alcoholics (Marchiori *et al.*, 1999; Windle, 1999; Horvath & Jonsdottir-Baldursson, 1990; Poldrugo & Forti, 1988). In the Tivis, Parsons, and Nixon (1998) study, State Anger, Trait Anger, Anger-In, and Anger Out correlated significantly with depression as measured by the BDI, while no relationship was found between scores on these STAXI scales and anxiety scores on the STAI.

While the administration of a personality inventory in the intoxicated state is problematic (due to time restraints, an inability to concentrate, and difficulties responding to a paper-and-pencil inventory), its use with sober subjects is possible. If this was implemented, important information concerning how anger relates to personality type might be obtained. A survey of well-developed inventories that are capable of accomplishing this task might include the California Psychological Inventory, third edition (CPI-3; Gough, 1987), the MMPI-2 (Hathaway & McKinley, 1989), and the MCMI-III (Millon, 1994).

The original versions of both the CPI and MMPI were constructed on the basis of contrasted group responses and contain three validity scales. The 550 items in the MMPI yield scores on ten "clinical" scales: Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, Masculinity-Femininity, Paranoia, Psychasthenia, Schizophrenia, Hypomania, and Social Introversion. The CPI has 480 items scored on 15 "Folk Scales" such as Dominance, Sociability, Responsibility, Socialization, self-Control, Achievement-via-Conformance, Achievement-via-Independence, Femininity, etc. The latest version of the CPI (CPI-3) contains five additional folk scales and 13 Special Purpose scales designed to assist in personnel selection. Both the CPI and MMPI require true or false responses to statements, are paper and pencil instruments, and take up to an hour to complete. Profile interpretation requires special training and the scales used do not conform to modern diagnoses as outlined in the DSM-IV-TR. The MMPI-2 and the CPI-3 have slightly fewer items than their predecessors. Special scales have been developed from the MMPI to measure both anger and alcoholism among numerous other factors (Anastasi, 1982).

The Millon Clinic Multiaxial Inventories were developed to provide scores on clinical scales that were consistent with accepted diagnoses. The MCMI-2 (Millon, 1983) was designed in accordance with the DSM-III-R (American Psychiatric Association, 1987), while the MCMI-3 (Millon, 1994) matches the DSM-IV. Using 175 items, the MCMI-3 scales assess the disorders, syndromes, and characteristics which can be found in Table 34. The average length of time needed to respond to the MCMI-III items is 25 minutes.

Table 34. MCMI-III Scales

Clinical Personality Patterns	
Scale 1	Schizoid
Scale 2A	Avoidant
Scale 2B	Depressive
Scale 3	Dependent
Scale 4	Histrionic
Scale 5	Narcissistic
Scale 6A	Antisocial
Scale 6B	Aggressive (Sadistic)
Scale 7	Compulsive
Scale 8	Passive-Aggressive
Scale 8B	Self-Defeating
Severe Personality Pathology	
Scale S	Schizotypal
Scale C	Borderline
Scale P	Paranoid
Clinical Syndromes	
Scale A	Anxiety Disorder
Scale H	Somatogorm Disorder
Scale N	Bipolar: Manic Disorder
Scale D	Dysthymic Disorder
Scale B	Alcohol Dependence
Scale T	Drug Dependence
Scale R	Post-Traumatic Stress Disorder
Severe Syndromes	
Scale SS	Thought Disorder
Scale CC	Major Depression
Scale PP	Delusional Disorder
Modifying Indices	
Scale X	Disclosure
Scale Y	Desirability
Scale Z	Debasement
Validity Index	
Scale V	Validity

(Millon, 1994)

Another 200-item self-report personality inventory consistent with the personality disorders found in the DSM-III is the Coolidge Axis II Inventory (Coolidge, 1984). This inventory includes Passive-Aggressive Personality Disorder as well as the 10 other personality disorders listed in the DSM-IV. One unique feature of the Coolidge inventory is that the items are derived directly from the 117 unique criteria used in axis II of the DSM III. While the Coolidge Axis II Inventory looks promising, it has not undergone the rigorous psychometric scrutiny of the MMPI-II, CPI-III, and MCMI-III.

If a personality inventory were to be used in a new study based on the present study, the MCMI-III seems best suited because it is well-developed, consistent with the DSM-IV, and takes the least amount of time to complete.

Practice Effects Related to the STAXI Administrations

As a rule, the second ("as if") and third ("now") STAXI administrations were done consecutively in the present study. For most subjects, the "as if" responses were obtained immediately prior to the "now" responses. Such methods could yield results that were very similar due to a "practice" effect where subjects remember their previous answers and simply repeat them (Anastasi, 1982). One solution for this potential problem would have been to alternate the order of administration for the "as if" and "now" responses between subjects. However, a review of the results of the Phase II analysis for the present (see Tables 17 to 27) study reveals that the mean "as if" and "now" responses are significantly different on the 69-item STAXI S-Anger, T-Anger, AX/Out, AX/Con-Out scales and the F, V, and P subscales. This suggests that "practice" effects were, in fact, minimal, and may not represent a significant limitation of the present study.

Unavailability of Appropriate Canadian STAXI Norms

The male and female norms used in this study are based on the responses given by various samples of the American population. At this time, there are no available 44-item STAXI norms for Canadians. The question of how similar these two populations are is a legitimate one.

Laughrea, Belanger, and Wright (1997) translated the 44-item STAXI into French-Canadian and used it in a study of anger involving 440 adults living together as couples. Subjects were further subdivided into a control group drawn from the general population, and a clinical group, who were seeking therapy. Means were calculated for the males and females who participated, and are presented in Table 35.

The Laughrea, Belanger, and Wright scale means are generally lower than the norms given by Spielberger (1996), especially with respect to the State and Trait Anger scores. Are Canadians generally more mellow, reserved, relaxed, or restrained than their American counterparts? If so, would this observation also hold true for Canadian alcoholics?

Although somewhat dated, Lipset's (1976) analysis concluded that Canadians are more conservative than their American counterparts. MacKinnon and Keating (1989) made a cross-cultural analysis of the structure of emotions using comparable samples of Canadian and American university students. These samples were found to be generally similar with regard to affect but MacKinnon and Keating noted that "U.S. subjects

Table 35. 44-Item STAXI Means Obtained by Laughrea, Belanger, and Wright (1997)

	Males (n = 110)		Females (n = 110)	
STAXI Scale	**M**	**S.D.**	**M**	**S.D.**
State Anger	6.7	1.8	7.3	2.5
Trait Anger	14.3	3.0	15.9	3.5
Angry Temperament	6.6	1.7	7.1	1.9
Angry Reaction	8.2	2.2	9.4	2.7
Anger In	16.6	4.1	15.8	4.3
Anger Out	13.0	3.5	12.5	3.8
Anger Control	23.4	4.8	22.5	4.6
Anger Expression	22.2	7.4	21.9	8.0

Note. M = Mean
S.D. = Standard Deviation

Note. From L'inventaire de l'expérience de la colère en situation sociale et conjugale: Validation auprès de la population adulte Québécoise", by K. Laughrea, C. Belanger, & J. Wright, 1997, Science et Comportement, 25, p.89. Copyright 1997 by Science et Comportement. Translated and reprinted with permission.

manifest greater emotional intensity on average than Canadian subjects" (p. 74). These results may have implications for the expected 44-item STAXI scale means if this inventory were to be standardized using a Canadian sample.

Common sense suggests that Canadian and American norms should differ, if only due to the greater number of minorities present in the U.S. (especially blacks and hispanics). In a study designed to assess the classification of angry and psychotic "black and white" psychiatric inpatients in the U.S., Greenblatt and Davis (1992) found that 51% of blacks reported being angry versus only 42% of whites. Watson and Sinha (1996) compared the responses of large samples of university students in Edmonton to the responses given by a similar group in Colorado on the Coolidge Axis-II Inventory. This enabled certain conclusions to be made regarding the relative prevalence of the DSM-IIIR personality disorders. The results showed that Dependent, Narcissistic, and Passive-Aggressive Personality Disorders occurred in significantly greater numbers in Canadian students, and that Histrionic Personality Disorders were significantly less frequent for the Edmonton sample. Of these disorders, Passive-Aggressive Personality Disorder is most directly linked to anger and the higher frequency found in Edmonton may partially explain the differences found in Anger-Out, for both males and females, in Tables 28 and 29.

A sample of "alcoholics" taking part in a three-week inpatient program after completion of the detoxification process, and drawn from the Edmonton area (i.e. AADAC Henwood facility), could be used to obtain STAXI responses that were more closely matched to the samples used in the Tivis, Parsons, and Nixon (1998), Potter-Efron and Potter-Efron (1991), and Walfish, Massey, and Krone (1990) studies.

Psychometric Properties of the STAXI

As a general rule, personality is more difficult to assess than performance. Personality instruments can be seen as relatively weak but necessary tools in the establishment of certain aspects of Psychology as a science. Test-retest reliability figures for the majority of personality measures are often only half those found for I.Q. tests (Anastasi, 1982). Indeed, the question of whether such relatively low reliability figures are a function of the instrument or the stability of personality traits over time is valid (Anastasi, 1982). Of course, responses associated with short-term "states" are expected to vary. Personality inventories are often accepted as "good" when they have been used in large numbers of research studies, as was the case with the original Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1951). Although the MMPI became a standard, it had many flaws such as high correlations between a number of scales (Anastasi, 1982).

The 44-item STAXI exhibits careful psychometric development but, in common with other instruments, has fairly low test-retest reliability figures (Jacobs, Latham, & Brown, 1988). In addition, the evidence included in the manual has been criticized as being inconclusive with respect to validity (Retzlaff, 1992). The number of published studies which have made use of the STAXI is growing steadily. As well, Spielberger continues to develop and refine the STAXI empirically (C. D. Spielberger, personal communication, August 27, 1998).

A Hypothetical Study for the Future

Many of the potential limitations of the present study could be corrected if a new, improved study were to be undertaken. Table 36 lists these limitations and some possible measures that may be taken to minimize them.

Brief details of the proposed hypothetical study are as follows. Three data collectors would be located at AADAC detoxification centre sites, one each in Edmonton (AADAC Recovery Centre), Grande Prairie (Northern Addictions Centre) and Calgary (Renfrew Recovery). The three STAXI administration conditions would be used again and the criteria for participation would remain unchanged. Additional demographic data would be collected and the MCMI-III would be administered to subjects in the "now" condition to assess personality. Data collection would continue until 50 males and 50

Table 36. Proposed Methods of Counteracting Limitations in a Future Study

Limitation	Remedy
Inadequate Sample Size	Use Multiple Comparable Sites and Several Data Collectors
Use of a Convenience Sample	Compare "Intoxicated" Group to Other Alcoholics Entering Detoxification if population of interest is defined as "alcoholics" in recovery. Use Stratified Random Sampling if Number of Subjects is Adequate.
Limited Collection of Demographic Data	Identify Education Level, SES, Drinking Patterns, Employment History/Status, Marital Status as Well as Age and Gender of Subjects.
Lack of Data Concerning Subjects' Personalities	Administer the MCMI in the "Now" Condition
"Practice" Effects in STAXI Administration	Alternate the Order of the "As If" and "Now" STAXI Administrations Between Subjects (may not be necessary).
Unavailability of Appropriate Canadian STAXI Norms or "Alcoholic" Reference Group	Obtain STAXI responses from Canadian "alcoholics" in post-detoxification 21-day inpatient treatment program for comparison purposes.

females had responded to the STAXI under the three specified conditions. The null hypotheses being tested in the new study would be similar to those of the present study but would also include references to the additional demographic and personality information. In the statistical analysis, the within subjects factor would again be condition ("initial", "as-if", or "now"), while between subjects factors would include gender, age category, employment history/status, marital status, SES, drinking history, MCMI personality type, and education level. The rather complex statistical analysis (with its inherent potential for multiple interactions) could be performed using univariate techniques (i.e. Analysis of Variance) on each STAXI scale or subscale, or multivariate techniques (i.e. Multivariate Analysis of Variance). This researcher would opt for a univariate analysis because the presentation of results is easier and more understandable, and the possibility of finding a complex interaction, which may be difficult to interpret, is minimized.

It may be advisable to test the feasibility of the additional measures proposed for the "hypothetical" study in a small pilot study consisting of 10 subjects. In this way, it could be determined whether or not the collection of extra demographic data, the administration of a personality inventory, and perhaps even the use of a Breathalyzer could be evaluated. For example, if subjects refuse to participate, or drop out of the pilot study in large numbers it may be a sign that the proposed measures are simply too cumbersome.

Implications for Treatment

The high attrition rate for the sample of "alcoholics" used could possibly be lowered if AADAC staff were particularly aware of and quickly remedied any situations likely to provoke anger. It has also been demonstrated that the actual physical environment can play a significant role in attrition (Evelina Kohlman, personal communication, September 22, 2000). Anger management (Hazeleus & Deffenbacher, 1986), assertiveness training (Nelson & Howell, 1983), and stress management (Rohsenow, Smith, & Johnson, 1985) have all been used with "alcoholics" with some success. However, the results of the present study show that "alcoholics" have near normal levels of anger once they are sober. This suggests that anger need not be a primary focus of treatment aimed at preventing alcohol consumption (i.e., relapsing while sober). When treating intoxicated individuals, special care is required to avoid stress or provocation, as discussed in Chapter II.

If such factors as Anger-In and a lack of Anger-Out serve as a conditioned stimulus for drinking while sober, strategies for dealing with situations which might provoke anger need to be developed. Research has shown that relapse prevention, an accepted cognitive-behavioral treatment for alcoholics, is an effective method for preventing drinking as a response to stress (Irvin, Bowers, Dunn, & Wang, 1999). Cognitive-behavioral strategies involve the identification of high-risk situations for relapse and the application of rehearsed methods to deal with them (Pagliaro & Pagliaro, 1996). It may be possible to integrate a relapse prevention program into the detoxification process. This would have to be simple and might include teaching an alternative to drinking when under stress, or setting up a "help" line that could be accessed when problems arise.

Summary

The results of the present study have revealed a number of significant differences based on the 69-Item STAXI responses of initially "intoxicated" subjects who enter detoxification. For men only, the "initial" anger scores were significantly higher than the American male norms on State Anger, Anger-In, and Anger Expression. In the "as if" condition, males were significantly higher than norms on the State Anger, Anger-In, and

Anger Expression scales, and significantly lower than norms on the Anger Control scale. In the same condition, females were significantly higher than American female norms on the State Anger scale. In the "now" condition, males only were significantly lower than norms on the Anger-Out scale. Additional analyses using a revised STAXI (Spielberger, 1995) found that scores on the State Anger, "Feel Like Expressing Anger", and Anger-Out scales were significantly different between the "initial" and "now" conditions. The "as if" scores were higher but not statistically different from the "initial" scores on every scale or subscale where a main effect for condition was found. They also were significantly different from the "now" scores on State Anger, the State Anger subscales, Trait Anger, and Anger Control-Out.

Although a number of possible limitations were identified, and discrepancies with the results of similar previous studies were noted, this study accomplished a difficult task and added to the existing knowledge concerning changes in anger associated with "intoxicated" alcoholics as they sober up.

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Appendix A

STAXI-ETF

Self-Rating Questionnaire

STAXI-ETF

		ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
1.	I am furious	1	2	3	4
2.	I feel irritated	1	2	3	4
3.	I feel angry	1	2	3	4
4.	I feel like yelling at somebody	1	2	3	4
5.	I feel like breaking things	1	2	3	4
6.	I am mad	1	2	3	4
7.	I feel like banging on the table	1	2	3	4
8.	I feel like hitting someone	1	2	3	4
9.	I am burned up	1	2	3	4
10.	I feel like swearing	1	2	3	4
11.	I feel annoyed	1	2	3	4
12.	I feel like kicking somebody	1	2	3	4
13.	I feel like cursing out loud	1	2	3	4
14.	I feel like shouting at someone	1	2	3	4
15.	I want to smash something	1	2	3	4
16.	I feel like screaming	1	2	3	4
17.	I feel like pounding somebody	1	2	3	4
18.	I feel like shouting out loud	1	2	3	4

19. I am quick tempered 1 2 3 4

20. I have a fiery temper 1 2 3 4

21. I am a hotheaded person 1 2 3 4

22. I get angry when I'm slowed down by others' mistakes 1 2 3 4

23. I feel annoyed when I am not given recognition for doing good work 1 2 3 4

24. I fly off the handle 1 2 3 4

25. When I get mad, I say nasty things 1 2 3 4

26. It makes me furious when I am criticized in front of others 1 2 3 4

27. When I get frustrated, I feel like hitting someone 1 2 3 4

28. I feel infuriated when I do a good job and get a poor evaluation 1 2 3 4

WHEN ANGRY OR FURIOUS . . . .

29. I control my temper 1 2 3 4

30. I express my anger 1 2 3 4

31. I keep things in 1 2 3 4

32. I am patient with others 1 2 3 4

33. I pout or sulk 1 2 3 4

34. I withdraw from people 1 2 3 4

35. I make sarcastic remarks to others 1 2 3 4

36. I keep my cool 1 2 3 4

37. I do things like slam doors 1 2 3 4

38. I boil inside, but I don't show it 1 2 3 4

39. I control my behavior 1 2 3 4

40. I argue with others 1 2 3 4

41. I tend to harbor grudges that I don't tell anyone about 1 2 3 4

42. I strike out at whatever infuriates me 1 2 3 4

43. I can stop myself from losing my temper 1 2 3 4

44. I am secretly quite critical of others 1 2 3 4

45. I am angrier than I am willing to admit 1 2 3 4

46. I calm down faster than most other people 1 2 3 4

47. I say nasty things 1 2 3 4

48. I try to be tolerant and understanding 1 2 3 4

49. I'm irritated a great deal more than people are aware of 1 2 3 4

50. I lose my temper 1 2 3 4

51. If someone annoys me, I'm apt to tell him or her how I feel 1 2 3 4

52. I control my angry feelings 1 2 3 4

53. I cool down as quickly as possible 1 2 3 4

54. I try not to express my anger 1 2 3 4

55. I cool off as soon as possible 1 2 3 4

56. I do not lash out at what angers me 1 2 3 4

57. I control my urge to express my angry feelings 1 2 3 4

58. I try to calm down 1 2 3 4

59. I take a deep breath and relax 1 2 3 4

60. I try to calm myself as soon as possible 1 2 3 4

61. I do things like counting to ten 1 2 3 4

62. I try to simmer down 1 2 3 4

63. I try to soothe my angry feelings 1 2 3 4

64. I endeavor to become calm again 1 2 3 4

65. I reduce my anger as soon as possible 1 2 3 4

66. I do something relaxing to calm down 1 2 3 4

67. I quickly get my anger under control 1 2 3 4

68. I try to relax 1 2 3 4

69. I do something soothing to calm down 1 2 3 4

Note. STAXI-ETF by C. D. Spielberger, 1995, Odessa, FL: Psychological Assessment Resources. Copyright 1979, 1986, 1988, 1995 by Psychological Assessment Resources, Inc. Reprinted with permission.

Appendix B

Consent Form

Detoxification

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

PROJECT TITLE: Anger and Anger Control Among Recovering Alcoholics.

RESEARCHER: John Williamson, Ph. D. Candidate, Department of Educational Psychology, University of Alberta, Phone 439-2898 (Days) or 455-5953 (Evenings). Supervisors: Dr. Louis Pagliaro and Professor Ann Marie Pagliaro, SARU, University of Alberta 492-2856.

I have been asked to participate in a study designed to assess anger among problem drinkers as they enter into and proceed through treatment.

I understand that I will be asked to respond to 69 statements that describe how I feel right now. I understand that I will be asked to respond again to these statements later in my treatment.

I, ______________________________ agree to voluntarily participate in this research project. I understand that the purpose of the research is to learn more about anger among problem drinkers.

I agree that the researcher can keep copies of my questionnaire responses and certain relevant personal information. Furthermore, I understand that such information will be kept confidential and stored securely, in a locked cabinet at the Substance Abusology Research Unit, University of Alberta.

I understand that if I withdraw from treatment that the investigator may still ask me to complete the anger questionnaire on one or more occasions. I understand that I can freely and without any penalty withdraw from participation in this study at any time by simply notifying the principal investigator.

I understand that it is the researcher's responsibility to ensure that I have understood and signed this consent form while I am sober if it is initially signed while, in his opinion, I am intoxicated.

I understand that participating, or not participating, in this study will have no negative effect upon my treatment.

I understand that the researcher may present the results from this study at a research conference, in a published paper, or in some other standard academic manner. In this regard, I understand that I will in all cases remain anonymous (and that neither my name, address, or any other unique identifying characteristic will be reported or shared with any individual or agency).

I have read, or have had read to me, this consent form. The researcher has provided me an opportunity to ask any questions that I have concerning this study and these have been answered to my satisfaction. A duplicate copy of this form is freely available to me upon request.

Participant's signature______________________________ Date____________________

Participant's Address____

____

Participant's Phone Number____

Researcher's signature______________________________ Date____________________